

INTERMODAL MANAGEMENT SYSTEM

FOR HAMPTON ROADS, VIRGINIA

2001



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ABSTRACT

This report is the third in a series of Intermodal Management System (IMS) reports for Hampton Roads, Virginia. Phase I of the *Intermodal Management System for Hampton Roads, Virginia*, which was released in July 1996, summarized the region's intermodal transportation system (intermodal facilities, major intermodal conflict points), identified the region's intermodal goals and objectives, and established performance measures for passenger and freight movements. Phase II, which was released in April 1998, summarized the movement of freight to, from, and within the region. International, national, and local level freight movements were also investigated for highway, rail, water, and air transportation modes. This document updates the two previous reports. It also includes a statewide freight movement analysis, a detailed regional truck analysis, and lists port-related improvements in Hampton Roads by 2021.

ACKNOWLEDGMENTS

This report was prepared by the Hampton Roads Planning District Commission (HRPDC) in cooperation with the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the Virginia Department of Transportation (VDOT), the Virginia Port Authority (VPA), and the member jurisdictions of the Hampton Roads region. The contents of this report reflect the views of the staff of the Hampton Roads Area Metropolitan Planning Organization (MPO). The MPO staff is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the FHWA, VDOT, or HRPDC. This report does not constitute a standard, specification, or regulation. FHWA or VDOT acceptance of this report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

EXECUTIVE SUMMARY

This report is the third in a series of Intermodal Management System (IMS) reports for Hampton Roads, Virginia. Phase I of the *Intermodal Management System for Hampton Roads, Virginia*, which was released in July 1996, summarized the region's intermodal transportation system (intermodal facilities, major intermodal conflict points), identified the region's intermodal goals and objectives, and established performance measures for passenger and freight movements. Phase II, which was released in April 1998, summarized the movement of freight to, from, and within the region. International, national, and local level freight movements were also investigated for highway, rail, water, and air transportation modes. This document updates the two previous reports. It also includes a statewide freight movement analysis, a detailed regional truck analysis, and lists port-related improvements in Hampton Roads by 2021.

STUDY FINDINGS:

International Freight Movement Through the Port of Hampton Roads

- The predominant bulk cargo at the Port of Hampton Roads is coal.
- Foreign coal trade through the Port of Hampton Roads has decreased by 48% from 1997 to 2000.
- General cargo at the Port of Hampton Roads is increasing at an annual rate of 8.9%.
- In comparison to ports on the U.S. East Coast, Hampton Roads ranked first in exports and fourth in imports in 1999.
- Hampton Roads is the second leading port on the U.S. East Coast behind the Port of New York in terms of total exports and imports in 1999.
- The top two world regions for imports and exports through the Port of Hampton Roads in 1999 were the Europe/Mediterranean/Middle East region and the Asia/India region.

Nationwide Freight Movement In and Out of Hampton Roads

- The analysis of the 1998 domestic freight movement by all transportation modes in and out of Hampton Roads found that 77.2 million tons of freight (\$71.8 billion commodity value) was transported into the region from other U.S. origins and 32.5 million tons of freight (\$66.0 billion commodity value) was outbound to U.S. destinations.
- Truck transport accounted for 50% of inbound freight and more than 74% of outbound freight for Hampton Roads.
- The primary domestic freight movement for Hampton Roads is with the South Atlantic region.

Statewide Freight Movement In and Out of Hampton Roads

- Inbound freight to Hampton Roads from Virginia PDCs accounts for 42% of the domestic freight to Hampton Roads, and freight outbound to Virginia PDCs accounts for 47% of the domestic freight from Hampton Roads.
- Of Virginia PDCs, Cumberland Plateau is responsible for the most inbound freight to Hampton Roads with 37.7%, and Northern Virginia is responsible for the most outbound freight with 46.6%.
- The primary mode of freight transportation between Hampton Roads and other Virginia PDCs is by truck.
- The primary Virginia access routes for truck traffic are Interstates 95 and 85.

Local Freight Movement In Hampton Roads

- The primary “gateway” of trucks entering and exiting Hampton Roads is I-64. Route 58 and Route 460 are also significant gateways to the region, with daily truck percentages over 20%.
- Of the freight movement within Hampton Roads, 31% moves between the Peninsula and Southside, while 60% stays on the Southside and 9% stays on the Peninsula.
- The Hampton Roads Bridge-Tunnel (I-64) is the primary crossing used to transport freight across the Hampton Roads harbor, with 58% of truck traffic crossing the harbor using that facility.

Regional Truck Data Analysis

- The average daily truck percentage on regional roadways is 5.2%. Fifteen of the 146 regional locations analyzed had a daily truck percentage greater than 10%. Most of these locations were rural and had lower than average traffic volumes.
- Fifteen locations also had greater than 2,500 trucks per day, but these locations were both in urban and rural locations.
- Eleven locations had greater than 200 trucks in the morning peak hour, and twelve locations had greater than 200 trucks in the afternoon peak hour. These locations were a mix of urban and rural locations.
- While total traffic volumes peak in the morning and late afternoon, truck volumes are consistent between 8:00 am and 5:00 pm. Truck volumes are slightly higher than average during the morning peak hour and are below average during the afternoon peak hour.

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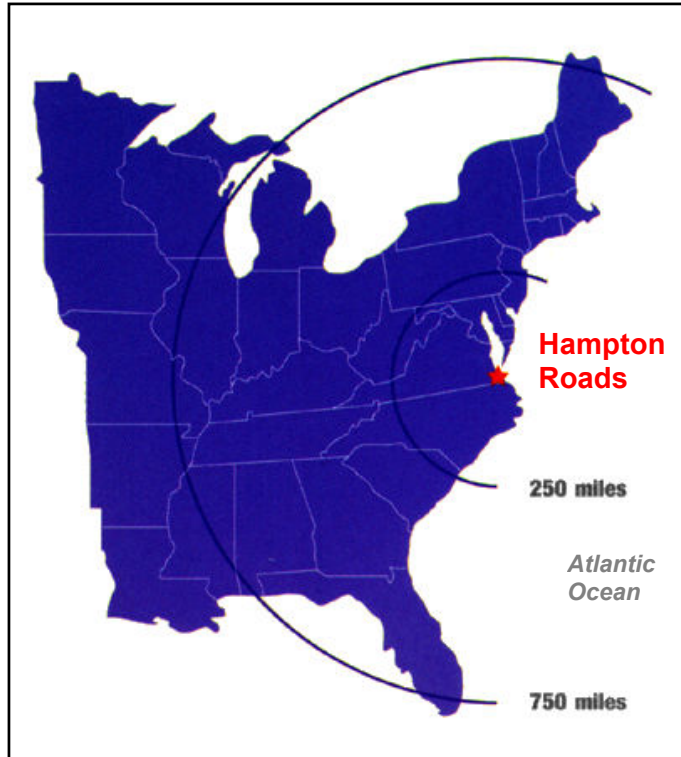
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INTRODUCTION

This report is the third in a series of Intermodal Management System (IMS) reports for Hampton Roads, Virginia. Phase I of the *Intermodal Management System for Hampton Roads, Virginia*¹, which was released in July 1996, summarized the region's intermodal transportation system (intermodal facilities, major intermodal conflict points), identified the region's intermodal goals and objectives, and established performance measures for passenger and freight movements. Phase II², which was released in April 1998, summarized the movement of freight to, from, and within the region. International, national, and local level freight movements were also investigated for highway, rail, water, and air transportation modes. This document updates the two previous reports. It also includes a statewide freight movement analysis, a detailed regional truck analysis, and lists port-related improvements in Hampton Roads by 2021. The Hampton Roads region includes sixteen localities with a total population of 1.56 million (2000 Census) and is located on the southeastern coast of Virginia (**Map 1**).



MAP 1 – Hampton Roads is located within 750 miles of two-thirds of the United States marketplace.

Source: Hampton Roads Technology Council

Background

Hampton Roads' mid-Atlantic location, combined with the transportation infrastructure, provides the region access within 750 miles of two-thirds of the United States marketplace (Map 1). In addition to its ideal location, Hampton Roads has the best natural deepwater harbor on the United States East Coast – Port of Hampton Roads. The Port of Hampton Roads attracts more than 80% of the world's major shipping lines, connecting the region with more than 100 nations and over 300 ports of call. These attributes make Hampton Roads a prime spot for business and industry. Moving goods quickly and efficiently in and out of Hampton Roads is essential to the region's economic success and must be carefully planned for.

¹ Hampton Roads Planning District Commission, "Intermodal Management System for Hampton Roads, Virginia, Phase I", July 1996.

² Hampton Roads Planning District Commission, "Intermodal Management System, Regional Freight Movement, Hampton Roads, Virginia", April 1998.

Goods are currently transported into and out of Hampton Roads by three primary means: containerships and other ocean-going vessels, motor carriers, and rail. Goods are also moved into and out of Hampton Roads by air, but to a much lesser extent. The predominant roadways utilized by truck traffic entering and leaving the region to access the Port of Hampton Roads are I-64 and U.S. Routes 13, 17, 58, and 460. Norfolk Southern Corporation (**Picture 1**) and the CSX Transportation, Incorporated are the primary rail service providers to the port.



PICTURE 1 – Norfolk Southern Corporation train located at the Norfolk International Terminal.

Port of Hampton Roads

The Port of Hampton Roads has built a solid reputation for efficient and uncongested intermodal service. The Port of Hampton Roads transports more intermodal containers to more cities faster and more efficiently than any other port in the United States. The Port of Hampton Roads consists of three marine terminals: [1] Norfolk International Terminal (NIT), [2] Portsmouth Marine Terminal (PMT), and [3] Newport News Marine Terminal (NNMT). These marine terminals are owned and managed by the Virginia Port Authority (VPA) and are operated by Virginia International Terminals, Incorporated (VIT). The Port of Hampton Roads boasts fifty-foot deep, unobstructed channels, which provide easy access and maneuvering room for the largest of today's container ships. Hampton Roads' ports are also located just 18 miles from the open sea on a year-round, ice-free harbor. In addition to Hampton Roads' three marine terminals is the Virginia Inland Port (VIP) located in Warren County, Virginia. The Virginia Inland Port operates in coordination with the Hampton Roads ports and serves as an intermodal container transfer facility. All four of these facilities,



MAP 2 – Port of Virginia terminal locations.
Source: Virginia Port Authority

shown in **Map 2** on page 2, comprise the Port of Virginia. Aerial photos of the Hampton Roads marine terminals are provided in **Pictures 2 – 4**.



PICTURE 2 – Norfolk International Terminal (NIT).
Source: Virginia Port Authority



PICTURE 3 – Newport News Marine Terminal (NNMT).
Source: Virginia Port Authority

The Port of Hampton Roads handles both **general** and **bulk** cargo. General cargo can be subdivided into container cargo and break-bulk cargo. **Container** cargo consists of commodities, such as lumber, animal feed, meat and fish, and newsprint that arrive at the terminal in individual units and are then packaged into containers (**Picture 5**). Container cargo, generally associated with truck sized steel boxes, is the primary method by which most cargo is now transported. **Break-bulk** consists of general cargo that is not packed in containers (rubber, cocoa beans, automobiles, and machinery). **Bulk** cargo refers to liquid and dry-bulk commodities, such as petroleum products, coal, and grains. Coal is the predominant type of bulk cargo transported through Hampton Roads. **Figure 1** on page 4 provides a visual breakdown of general and bulk cargo.



PICTURE 4 – Portsmouth Marine Terminal (PMT).
Source: Virginia Port Authority



PICTURE 5 – Container cargo at the Portsmouth Marine Terminal.

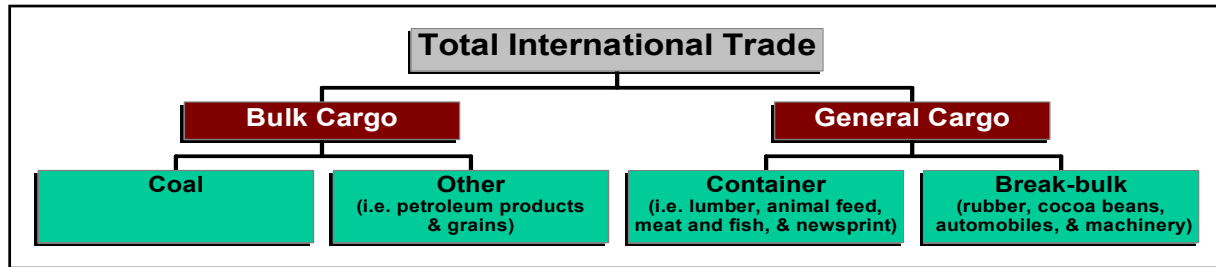


FIGURE 1 – Breakdown of International Trade Cargo Through the Port of Hampton Roads.

Report Contents

The first section of this report provides a comprehensive list of intermodal facilities, port facilities, and intermodal conflict points for the Hampton Roads region. The second section focuses on the historical trends in freight movement through the Port of Hampton Roads. This report also examines freight transportation through Hampton Roads including modes, origins and destinations, total tonnage, commodity value, and primary access routes on a nationwide, statewide, and local level. In order to analyze the movement of goods, data was obtained from the Transearch Database, developed by Reebie Associates, Inc. The Transearch Database tracks domestic freight movement by transportation mode in each state of the United States. The freight data obtained from the Transearch Database was for the year 1998. This report also provides an extensive regional truck data analysis for Hampton Roads based on 147 24-hour classification counts taken from April 2000 to April 2001. Finally, a description of port-related improvements in the Transportation Improvement Program (TIP FY 01-04) and 2021 Long Range Transportation Plan is provided.

This report has been organized into the following sections:

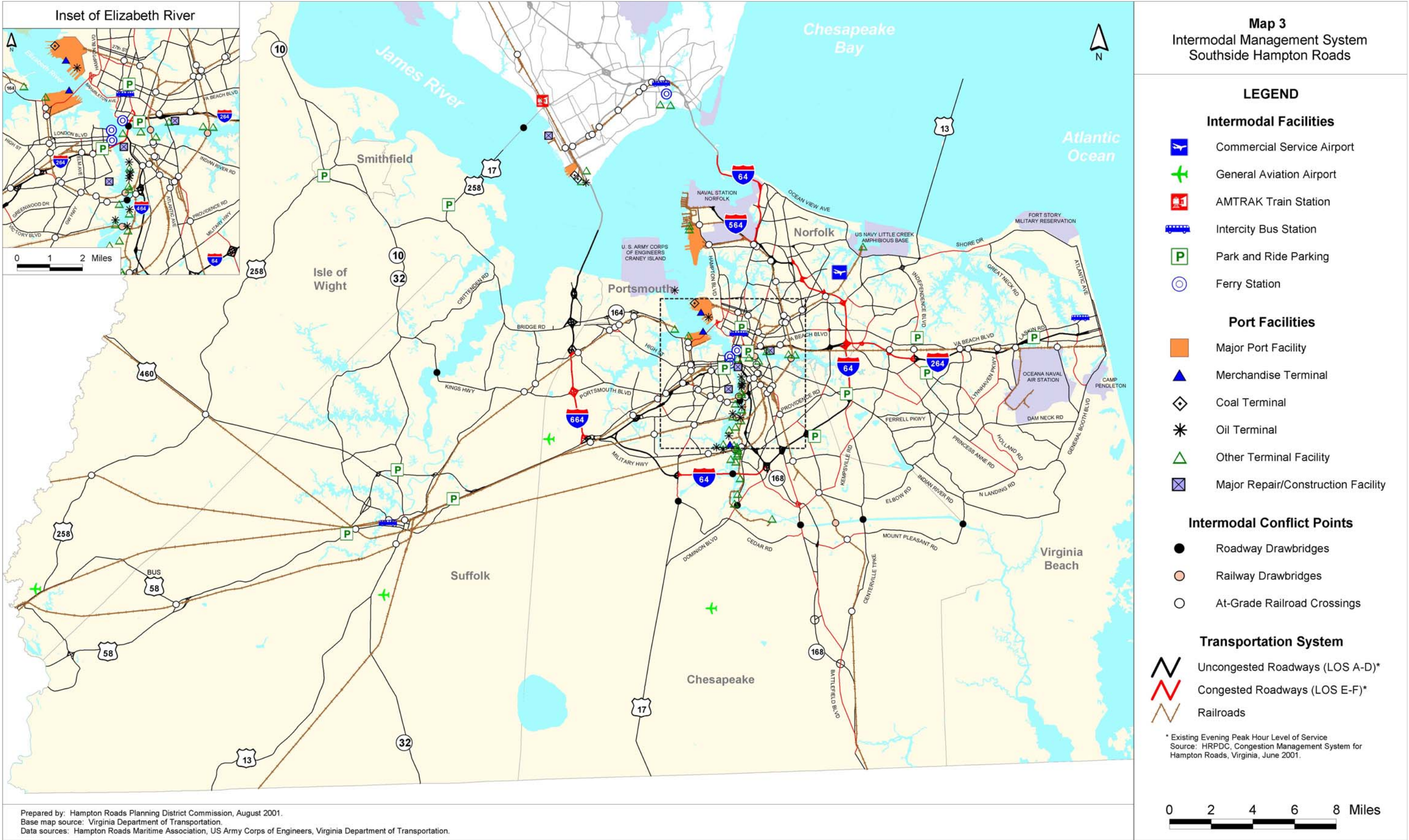
- Intermodal Management System Facilities
- Trends in Freight Movement through the Port of Hampton Roads
- Nationwide Freight Movement In and Out of Hampton Roads
- Statewide Freight Movement In and Out of Hampton Roads
- Local Freight Movement In Hampton Roads
- Regional Truck Data Analysis
- Future Port-Related Improvements
- Summary

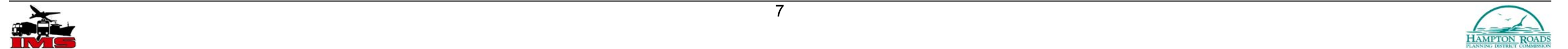
INTERMODAL MANAGEMENT SYSTEM FACILITIES

An inventory of regional intermodal facilities is included in **Appendix A**. Types of Intermodal Facilities in this inventory include:

- Commercial Service Airports
- General Aviation Airports
- Railroad Passenger Terminals
- Intercity Bus Stations
- Park and Ride Parking Lots
- Ferry Stations
- Port Facilities and Terminals
- Major Marine Repair and Construction Facilities
- Congestion Management System (CMS) Roadway Network
- Railroad Network

Intermodal conflict points, such as drawbridges and at-grade railroad crossings, are also included in the regional intermodal facilities inventory. **Map 3** on page 6 shows the locations of Intermodal Management System facilities on the Southside, and **Map 4** on page 7 shows the Peninsula intermodal facilities.





TRENDS IN FREIGHT MOVEMENT THROUGH THE PORT OF HAMPTON ROADS

General and Bulk Cargo

As discussed in the Introduction, cargo that is handled at the Port of Hampton Roads is classified as either **general** cargo or **bulk** cargo. In addition, general cargo is typically subdivided into **container** cargo and **break-bulk** cargo.

Figure 2 provides a summary of the international trade by tonnage for the Port of Hampton Roads from 1995 to 1999. General cargo has gradually increased from approximately 9 million tons to 12 million tons while bulk cargo has fallen significantly from approximately 51 million tons to 32 million tons since 1995. The decline in foreign trade is associated to the recent decline in coal, as shown in **Figure 3**. **Figure 3** separates bulk cargo that is coal from the other bulk commodities. Coal tonnage at the Port of Hampton Roads has decreased by 43% from 1997 to 1999.

Figure 4 on page 9 shows the summary of international trade through the Port of Hampton Roads by dollar value for from 1995 to 1999.

By tonnage (Figure 2), bulk cargo comprised the majority of freight. When looking at the summary of total foreign trade by dollar value, general cargo commands the majority. Even though general cargo tons are low, the value of those goods are higher than to bulk cargo items.

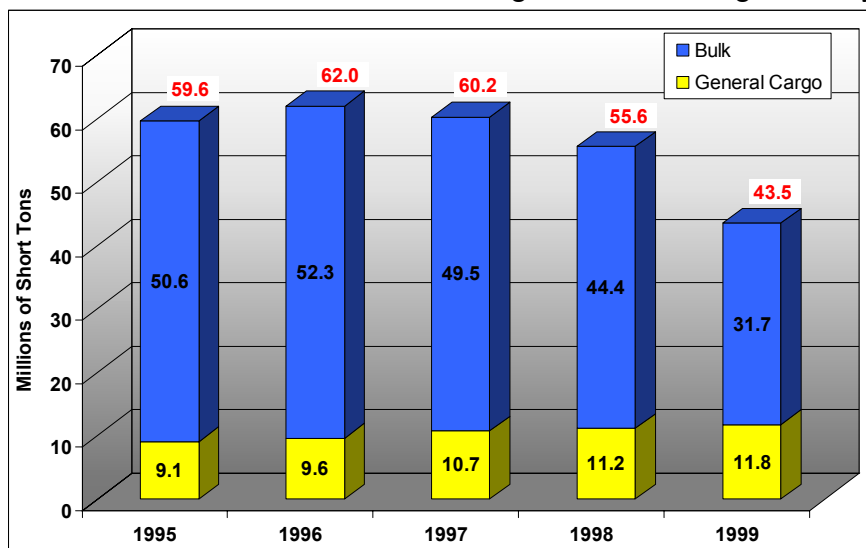


FIGURE 2 – International Trade Through the Port of Hampton Roads by Tonnage (1995 – 1999).

Source: Virginia Port Authority

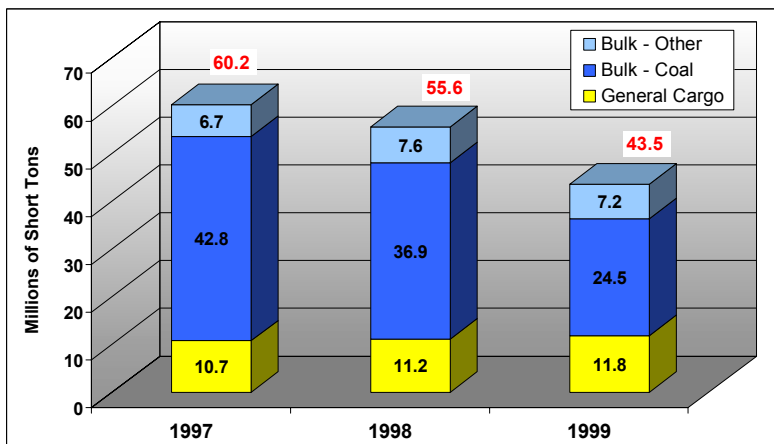


FIGURE 3 – Breakdown of International Trade Through the Port of Hampton Roads by Tonnage (1997 – 1999).

Source: Virginia Port Authority, T. Parker Host, Inc.

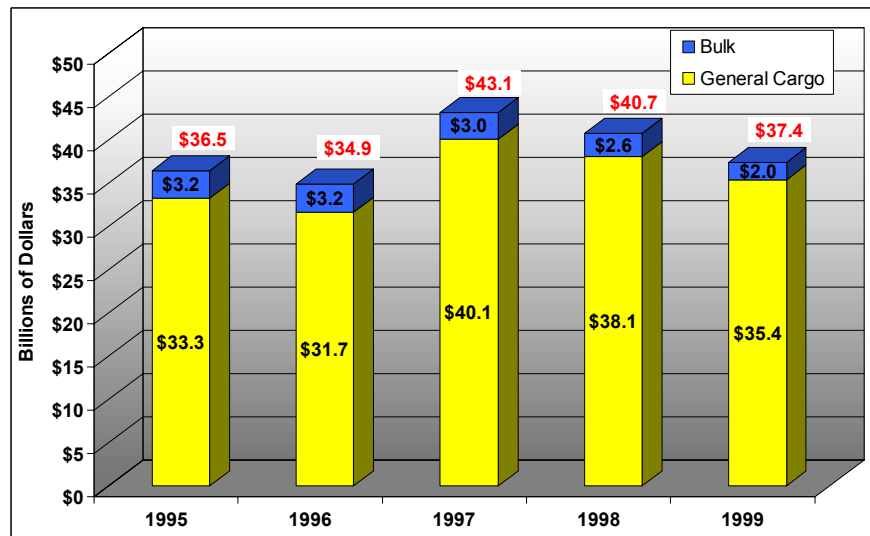


FIGURE 4 – International Trade Through the Port of Hampton Roads by Dollar Value (1995 – 1999).

Source: Virginia Port Authority

Figure 5 depicts the growth in trends for foreign general cargo tonnage at the Port of Hampton Roads since 1982. As shown in Figure 5, the tonnage of international general cargo handled at the Port increased at a rate of approximately 9% per year, from 2.5 million tons in 1982 to 12.0 million tons in 2000, an unmatched growth record among U.S. ports (Hampton Roads Maritime Association). Figure 5 also reveals that the growth in general cargo handled at the Port is entirely attributable to container cargo. For the period from 1982 to 2000, the tonnage of break-bulk cargo moving through the Port decreased at an annual rate of approximately 1.7%. During the same period, foreign container cargo tonnage handled at the Port of Hampton Roads increased at an annual rate of approximately 11%.

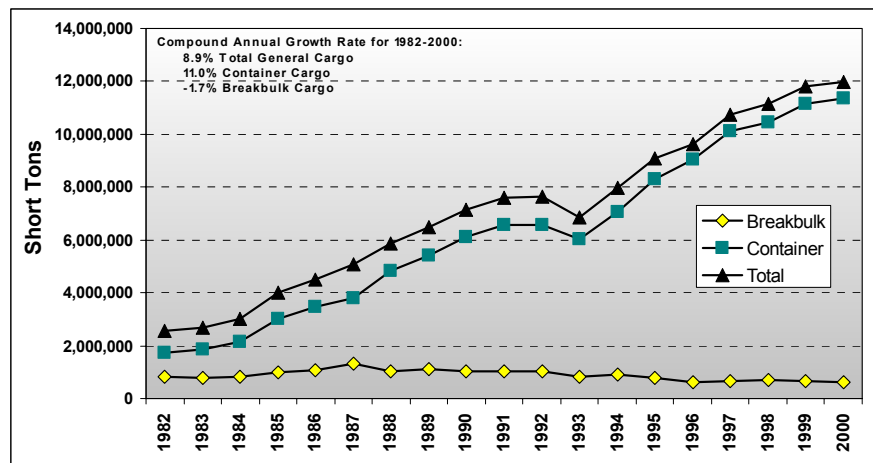


FIGURE 5 – Growth in International General Cargo By Type Through the Port of Hampton Roads (1982 – 2000).

Source: Hampton Roads Maritime Association

The predominant bulk cargo at the Port of Hampton Roads is coal. There is currently a downward trend of coal loadings at the Port. In 1997, the Port handled approximately 52 million tons of coal, more than five times the tonnage of general cargo handled that year. More recently in 2000, the Port handled approximately 32 million

tons of coal, which was three times the general cargo tonnage for that year. **Figure 6** shows the coal loadings at the Port of Hampton Roads for both foreign and domestic trade from 1982 through 2000.

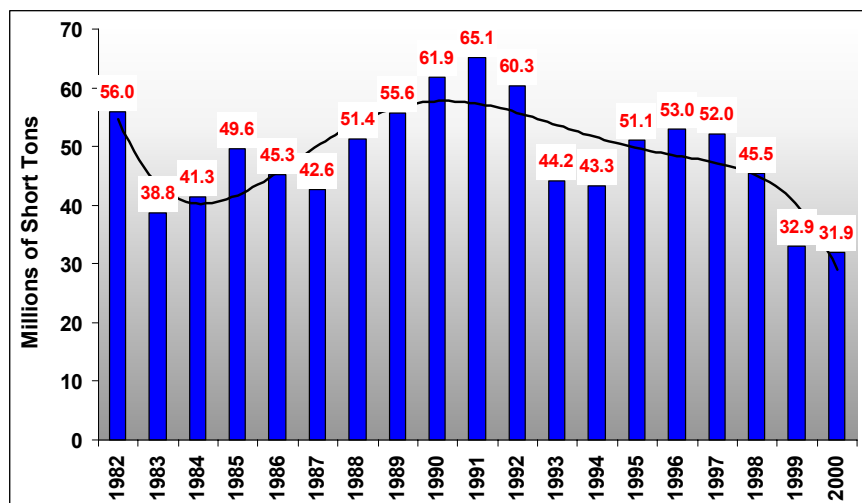


FIGURE 6 – Coal Loadings in the Port of Hampton Roads (1982 – 2000).

Source: Hampton Roads Maritime Association

The reduction in coal loadings at the Port of Hampton Roads is attributed to the decrease in foreign coal trade. **Figure 7** provides a breakdown for both foreign and domestic coal loadings from 1997 to 2000. The movement of coal within the United States at the Port of Hampton Roads has remained around 9 million tons since 1997. Foreign coal loadings, however, decreased by nearly half from approximately 43 million tons in 1997 to 22 million tons in 2000. The decline in foreign coal trade can be attributed to a combination of factors³. Foreign countries have recently been able to purchase coal at cheaper costs from other countries, such as Australia, China, and South Africa. Coal mines in the U.S. have also been able to sell coal domestically at a better price than they can internationally. Finally, the last reason for the recent coal decline is that the American dollar is currently weak overseas. Data for foreign and domestic coal loadings prior to 1997 was unavailable.

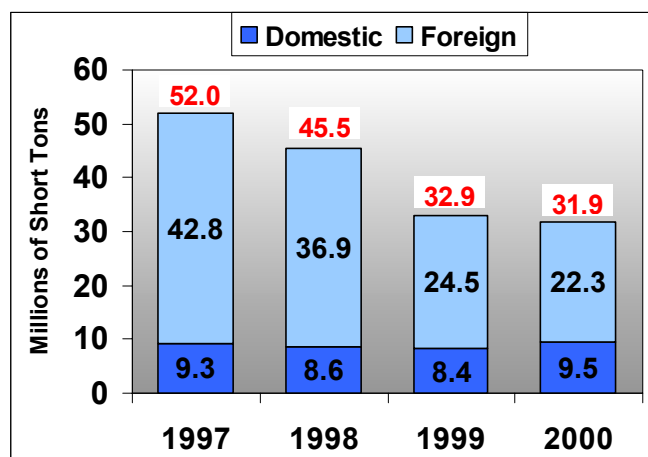


FIGURE 7 – Foreign and Domestic Coal Loadings in the Port of Hampton Roads (1997 – 2000).

Source: T. Parker Host, Inc.

Comparison with Principal Atlantic Coast Ports

In comparison to ports on the U.S. East Coast, Hampton Roads ranked first in exports and fourth in imports in 1999. In terms of total imports and exports, the Port of Hampton Roads ranked second behind the Port of New York. **Figure 8** on page 11 summarizes the comparison of imports and exports at the six major East Coast ports. As shown in Figure 9, Hampton Roads handled 53% of the total East Coast exports,

³ Based on conversation with T. Parker Host, Inc., Ship Agents and Brokers, Norfolk, Virginia on October 17, 2001.

totaling approximately 31.5 million tons in 1999. The Port of Hampton Roads accounted for 9% of total East Coast imports, handling approximately 12 million tons of freight.

Figure 9 shows the total imports and exports for Principal Atlantic Coast ports from 1990 to 1999. Total imports and exports for Hampton Roads remained comparable to those handled by the Port of New York in the mid 1990's. Lately, the total imports and exports handled at the Port of Hampton Roads have decreased significantly due to the drop in coal exports, while those at the Port of New York have steadily increased.

Figure 10 summarizes the movements of general cargo through the principal ports on the U.S. East Coast for 1999. Hampton Roads moved 11.8 million tons in 1999, second behind the Port of New York, which handled 16 million tons. The Port of Charleston was slightly behind the Port of Hampton Roads moving 11.7 million tons of general cargo.

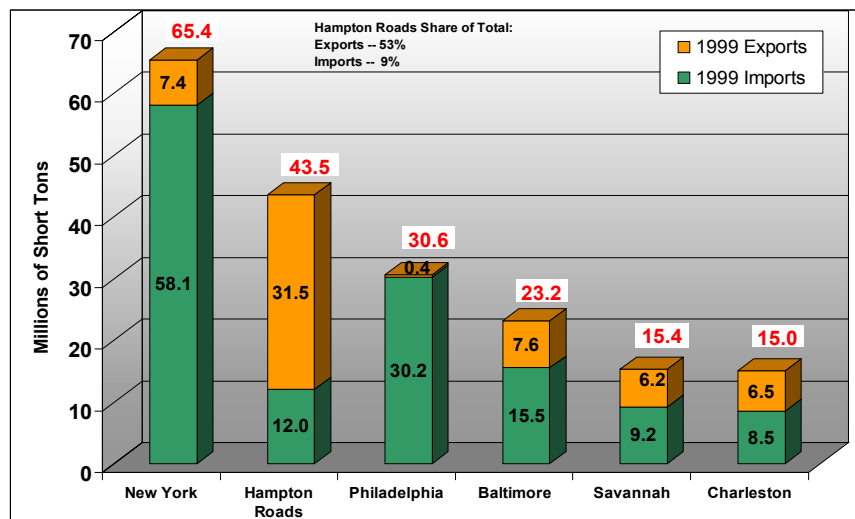


FIGURE 8 – Imports and Exports Through Principal Atlantic Coast Ports (1999).
Source: Hampton Roads Maritime Association

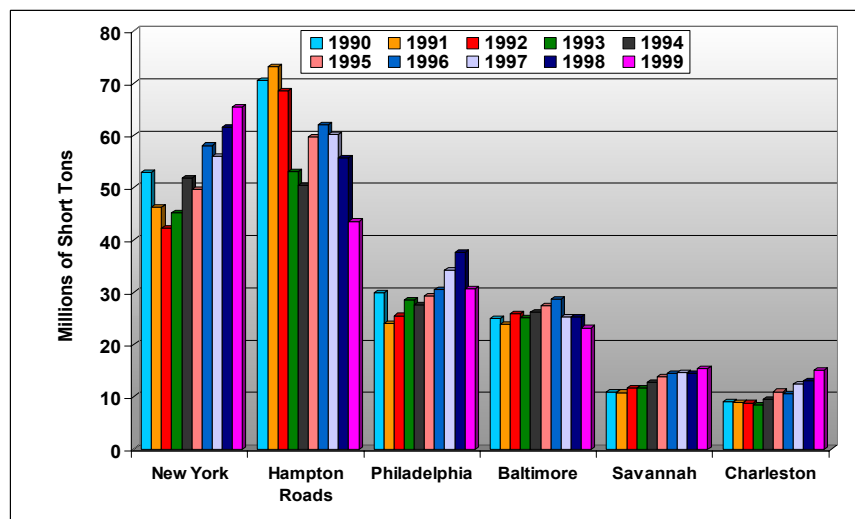


FIGURE 9 – Total Imports and Exports Through Principal Atlantic Coast Ports (1990 – 1999).
Source: Hampton Roads Maritime Association

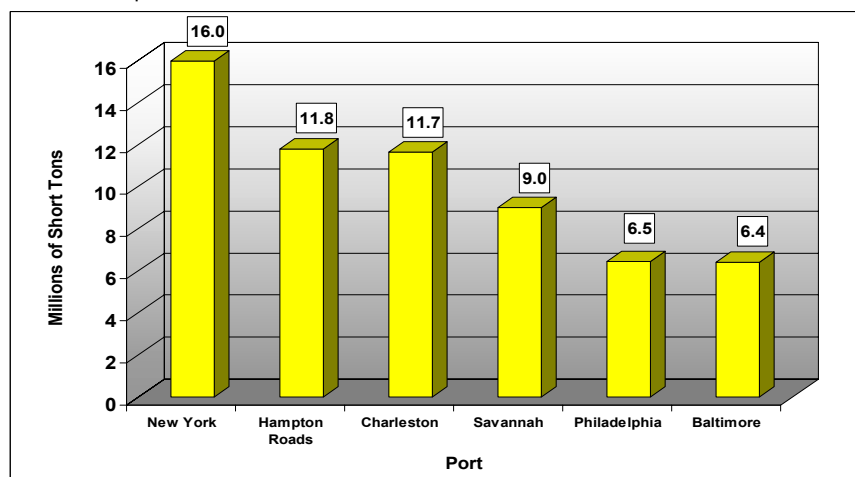


FIGURE 10 – General Cargo Movements Through Principal Atlantic Coast Ports (1999).
Source: Hampton Roads Maritime Association

International Trading Partners

The top two world regions for imports and exports through the Port of Hampton Roads in 1999, as shown in **Figure 11**, were the Europe, Mediterranean, and Middle East region and the Asia and India region. These two regions alone accounted for 83% of the total exports and imports for Hampton Roads. Approximately 55% of the imports and 54% of the exports through the Port of Hampton Roads were related to the Europe, Mediterranean, and Middle East region. Approximately 23% of the imports and 31% of the exports were related to the Asia and India region.

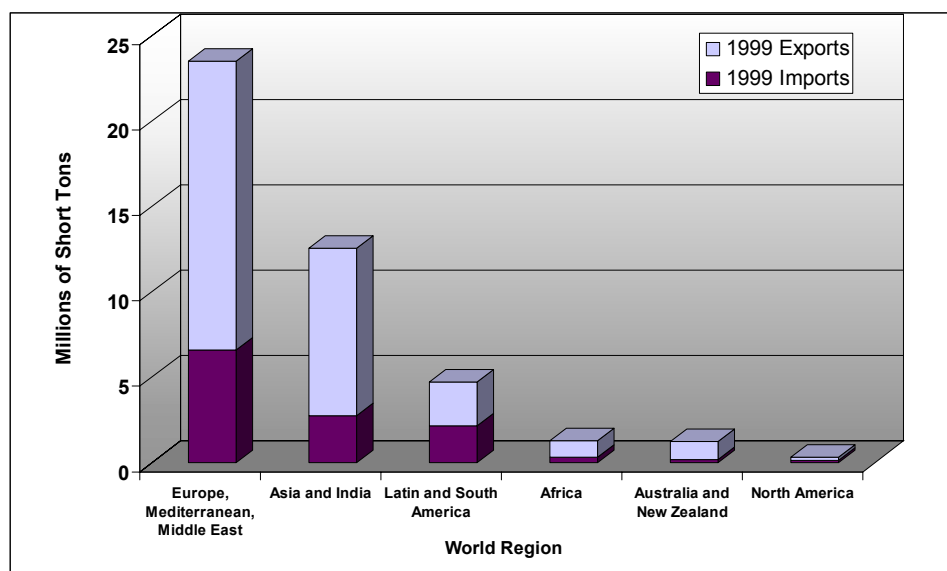


FIGURE 11 – International Trading Partners with the Port of Hampton Roads (1999).
Source: Hampton Roads Maritime Association

NATIONWIDE FREIGHT MOVEMENT IN AND OUT OF HAMPTON ROADS

The analysis of the 1998 domestic freight movement by all transportation modes in and out of Hampton Roads⁴ found that 77.2 million tons of freight (\$71.8 billion commodity value) was transported into the region from other U.S. origins and 32.5 million tons of freight (\$66.0 billion commodity value) was outbound to U.S. destinations (**Figure 12**).

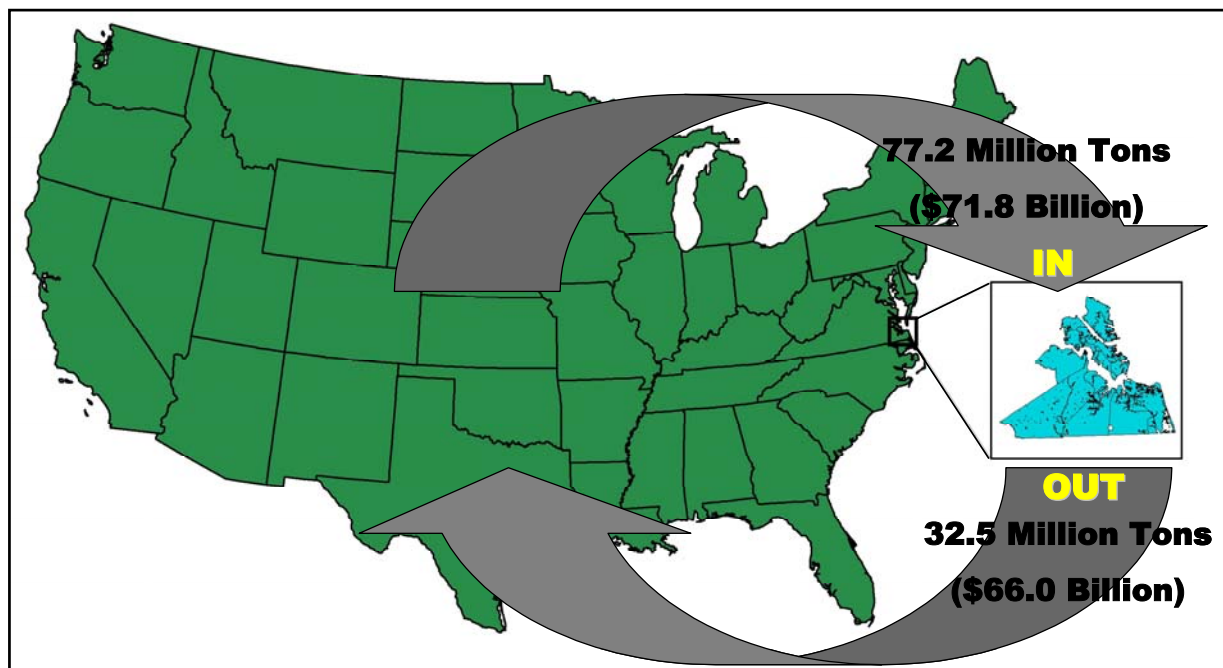


FIGURE 12 – Domestic Freight Movement In and Out of Hampton Roads by All Transportation Modes (1998).
Source: Reebie Associates Transearch Database.

⁴ Jurisdictions included in Hampton Roads in the nationwide freight movement analysis were: Gloucester, Isle of Wight, James City, York, Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg.

Table 1 lists the top ten commodities handled by the Port of Hampton Roads in domestic trade in 1998. The total tonnage of inbound freight (77.2 million) was more than double the tonnage of outbound freight (32.5 million). A majority of inbound freight from other U.S. regions was coal (about 60%), which is a relatively cheap commodity; this helps explain why the total value of all inbound commodities (\$71.8 billion) was close to the total value of outbound commodities (\$66.0 billion).

TABLE 1 – 1998 Top Ten Inbound and Outbound Commodities for Hampton Roads To and From the United States

Inbound Freight

Commodity	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent of Total Inbound	Commodity Value
BITUMINOUS COAL	44,683,996	650,040	0	0	45,334,036	59%	\$1,189,312,716
MISC WASTE OR SCRAP	0	0	0	5,161,259	5,161,259	7%	\$35,284,015,031
WAREHOUSE & DISTRIBUTION CENTER	0	3,405,102	0	0	3,405,102	4%	N/A
BROKEN STONE OR RIPRAP	1,211,836	0	0	426,821	1,638,657	2%	\$9,135,283
FAK SHIPMENTS	1,408,052	0	3,135	0	1,411,187	2%	\$10,434,205,131
PETROLEUM REFINING PRODUCTS	0	329,316	0	981,567	1,310,883	2%	\$323,973,496
PRIMARY FOREST MATERIALS	0	1,159,244	0	0	1,159,244	2%	\$83,270,225
READY-MIX CONCRETE, WET	0	1,037,224	0	0	1,037,224	1%	\$33,591,449
BITUMINOUS COAL OR LIGNITE	909,838	0	0	0	909,838	1%	\$23,869,082
RAIL INTERMODAL DRAYAGE	0	885,721	0	0	885,721	1%	N/A
Subtotaled Tonnage for the Top 10 Commodities					62,253,151		
Total Tonnage Transported					77,193,941		

Outbound Freight

Commodity	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent of Total Outbound	Commodity Value
WAREHOUSE & DISTRIBUTION CENTER	0	6,304,611	0	0	6,304,611	19%	N/A
PETROLEUM REFINING PRODUCTS	0	1,085,058	0	1,635,215	2,720,273	8%	\$672,292,079
GRAVEL OR SAND	0	0	0	1,237,145	1,237,145	4%	\$7,021,647
MISC WASTE OR SCRAP	0	0	0	1,196,609	1,196,609	4%	\$8,180,401,321
FAK SHIPMENTS	1,137,416	0	0	0	1,137,416	3%	\$8,409,966,262
READY-MIX CONCRETE, WET	0	1,011,470	0	0	1,011,470	3%	\$32,757,393
RAIL INTERMODAL DRAYAGE	0	958,889	0	0	958,889	3%	N/A
MOTOR VEHICLES	0	766,111	0	118,014	884,125	3%	\$5,563,483,690
BROKEN STONE OR RIPRAP	0	0	0	855,035	855,035	3%	\$4,766,700
POTASSIUM OR SODIUM COMPOUND	36,590	806,547	0	3,401	846,538	3%	\$211,100,500
Subtotaled Tonnage for the Top 10 Commodities					17,152,110		
Total Tonnage Transported					32,522,418		

Source: Reebe Associates Transearch Database.

For the purpose of this analysis, the United States was split into the nine Census divisions as shown in **Table 2**. The movement of domestic freight from each U.S. division to and from Hampton Roads was determined for each mode of travel.

TABLE 2 – United States Census Divisions.

<i>Division 1: New England</i>	<i>Division 4: West North Central</i>	<i>Division 7: West South Central</i>
Maine New Hampshire Vermont Massachusetts Rhode Island Connecticut	Minnesota Iowa Missouri North Dakota South Dakota Nebraska Kansas	Arkansas Louisiana Oklahoma Texas
<i>Division 2: Middle Atlantic</i>	<i>Division 5: South Atlantic</i>	<i>Division 8: Mountain</i>
New York New Jersey Pennsylvania	Delaware Maryland District of Columbia Virginia West Virginia North Carolina South Carolina Georgia Florida	Montana Idaho Wyoming Colorado New Mexico Arizona Utah Nevada
<i>Division 3: East North Central</i>	<i>Division 6: East South Central</i>	<i>Division 9: Pacific</i>
Ohio Indiana Illinois Michigan Wisconsin	Kentucky Tennessee Alabama Mississippi	Washington Oregon California Alaska Hawaii

As a result of the overwhelming impact that coal transport has on freight movement in and out of Hampton Roads, coal data was separated out for this portion of the analysis. **Table 3** on page 16 provides a detailed summary of coal transport from each U.S. Division to and from Hampton Roads for each transportation mode. All coal delivered by rail was non-container freight.

TABLE 3 – Summary of 1998 Domestic Freight To and From Hampton Roads – Only Coal**Inbound Coal by Mode**

Origination Census Division	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent
New England	0	0	0	0	0	0.0%
Middle Atlantic	198,722	45,733	0	0	244,455	0.5%
East North Central	0	0	0	0	0	0.0%
West North Central	0	0	0	0	0	0.0%
South Atlantic	32,546,014	592,133	0	0	33,138,147	71.7%
East South Central	12,074,605	12,174	0	0	12,086,779	26.1%
West South Central	0	0	0	0	0	0.0%
Mountain	0	0	0	0	0	0.0%
Pacific	0	0	0	0	0	0.0%
Unknown*	774,493	0	0	0	774,493	1.7%
Grand Total	45,593,834	650,040	0	0	46,243,874	
Modal Split Percent	98.6%	1.4%	0.0%	0.0%		

Outbound Coal by Mode

Destination Census Division	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent
New England	0	0	0	0	0	0.0%
Middle Atlantic	0	148	0	0	148	100.0%
East North Central	0	0	0	0	0	0.0%
West North Central	0	0	0	0	0	0.0%
South Atlantic	0	0	0	0	0	0.0%
East South Central	0	0	0	0	0	0.0%
West South Central	0	0	0	0	0	0.0%
Mountain	0	0	0	0	0	0.0%
Pacific	0	0	0	0	0	0.0%
Unknown*	0	0	0	0	0	0.0%
Grand Total	0	148	0	0	148	
Modal Split Percent	0.0%	100.0%	0.0%	0.0%		

Source: Reebe Associates Transearch Database.

*The Transearch Database contained some rail freight movements with unknown U.S. origins or destinations.

Excluding coal, which is primarily transported by railcar, the predominant mode of transportation for all other freight into and out of Hampton Roads was truck. Truck transport accounted for 50% of inbound freight and more than 74% of outbound freight. Rail transport accounted for approximately 26% of inbound freight and 11% of outbound freight. Water transport accounted for almost 25% of inbound freight and nearly 20% of outbound freight. The least used mode for freight transport was air, which accounted for approximately 0.05% of inbound freight and 0.04% of outbound freight. A summary of these results is found in **Table 4** on page 17 and **Maps 5** and **6** on pages 18 and 19.

Figures 13 and **14** on page 17 show the modal distribution of domestic freight by tonnage and dollar value (excluding coal). The distribution of freight among the various modes varies when comparing by tonnage or by commodity values. For example, freight delivered by air may be insignificant in terms of overall tonnage, but by dollar value it comprises a larger percentage due to the value of the items shipped.

TABLE 4 – Summary of 1998 Domestic Freight To and From Hampton Roads – Excluding Coal

Inbound Freight by Mode

Origination Census Division	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent
New England	0	167,841	23	960	168,824	0.5%
Middle Atlantic	57,114	1,405,401	3,642	313,098	1,779,255	5.7%
East North Central	1,768,044	1,433,695	1,354	14,332	3,217,426	10.4%
West North Central	160,194	220,381	21	0	380,597	1.2%
South Atlantic	5,099,773	10,886,786	6,719	7,239,562	23,232,840	75.1%
East South Central	430,052	803,591	2,420	0	1,236,063	4.0%
West South Central	62,326	332,706	1,527	13,107	409,666	1.3%
Mountain	7,950	64,463	0	0	72,413	0.2%
Pacific	31,016	135,348	0	0	166,364	0.5%
Unknown*	286,618	0	0	0	286,618	0.9%
Grand Total	7,903,088	15,450,214	15,706	7,581,059	30,950,066	
Modal Split Percent	25.5%	49.9%	0.1%	24.5%		

Outbound Freight by Mode

Destination Census Division	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent
New England	12056	128,635	15	0	140,707	0.4%
Middle Atlantic	313,214	2,626,254	2,655	1,134,429	4,076,551	12.5%
East North Central	1,243,994	1,796,961	994	564	3,042,512	9.4%
West North Central	115,106	342,047	114	0	457,267	1.4%
South Atlantic	719,753	16,209,317	4,794	4,941,409	21,875,272	67.3%
East South Central	248,097	1,054,994	2,150	1,815	1,307,056	4.0%
West South Central	56,707	476,294	1,377	0	534,378	1.6%
Mountain	0	75,090	0	0	75,090	0.2%
Pacific	38,822	318,559	0	0	357,381	1.1%
Unknown*	656,056	0	0	0	656,056	2.0%
Grand Total	3,403,803	23,028,150	12,099	6,078,217	32,522,270	
Modal Split Percent	10.5%	70.8%	0.0%	18.7%		

Source: Reebie Associates Transearch Database.

*The Transearch Database contained some rail freight movements with unknown U.S. origins or destinations.

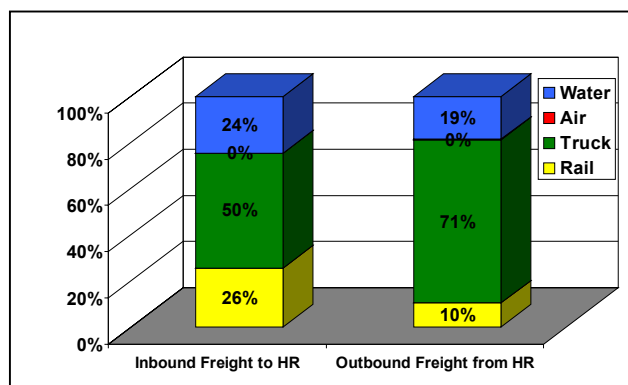


FIGURE 13 – Modal Distribution of 1998 Domestic Freight by Tonnage (Excluding Coal).

Source: Reebie Associates Transearch Database.

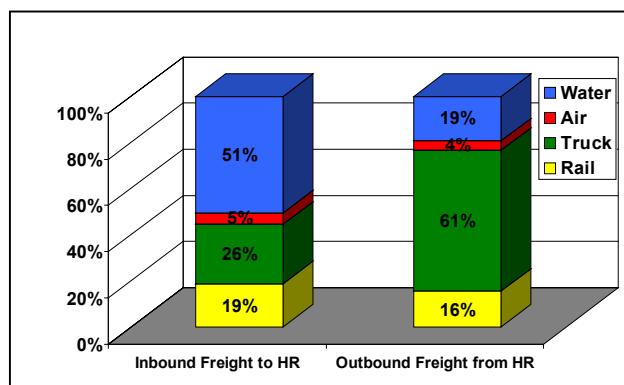
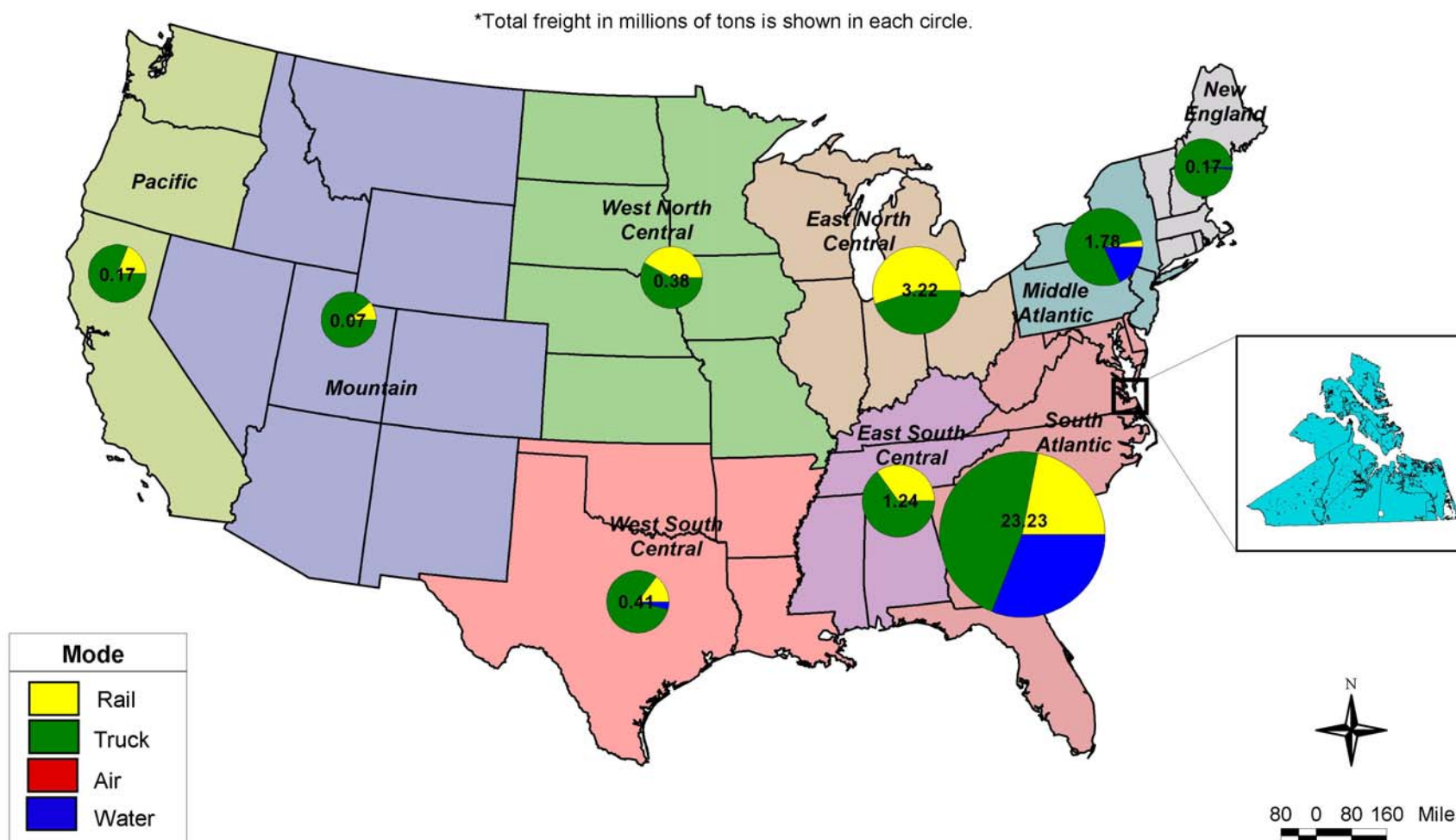


FIGURE 14 – Modal Distribution of 1998 Domestic Freight by Dollar Value (Excluding Coal).

Source: Reebie Associates Transearch Database.

Map 5
Summary of 1998 Inbound Freight from U.S. Census Divisions to Hampton Roads by Mode
(Excluding Coal)

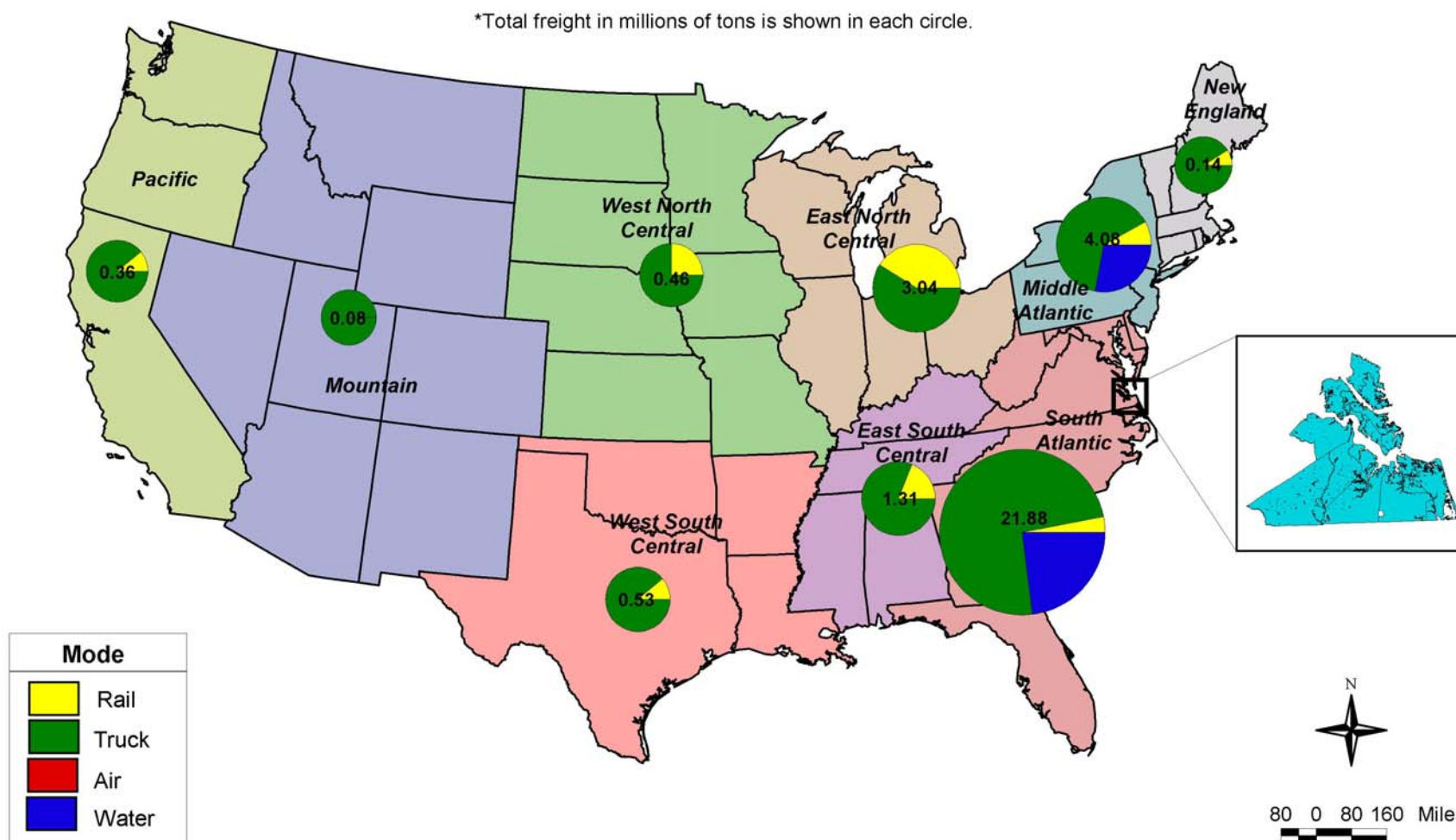


Prepared by: Hampton Roads Planning District Commission, September 2001.

Base map source: ESRI

Data source: Reebie Associates Transearch Database (Note: 0.29 million tons of freight transported by rail had an unknown U.S. origin due to unavailable data)

Map 6
Summary of 1998 Outbound Freight from Hampton Roads to U.S. Census Divisions by Mode
(Excluding Coal)



Prepared by: Hampton Roads Planning District Commission, September 2001.

Base map source: ESRI

Data source: Reebie Associates Transearch Database (Note: 0.66 million tons of freight transported by rail had an unknown U.S. destination due to unavailable data)

The analysis of rail transport into and out of Hampton Roads was divided into two categories: container and non-container (break-bulk) freight. Some common examples of containerized cargo include lumber, animal feed, meat and fish, and newsprint. Break-bulk cargo items include rubber, cocoa beans, automobiles, and machinery. Freight transport by container is becoming more popular and attractive to shippers due to the portability of containers from one mode to another. The analysis of the 1998 freight data showed that, excluding coal, approximately 24% of the 7.9 million tons of freight transported by rail into Hampton Roads was container cargo, while 19% of the 3.4 million tons of outbound freight was container cargo. **Table 5** and **Maps 7** and **8** on pages 21 and 22 summarize the analysis of domestic rail transport to and from Hampton Roads for the year 1998.

TABLE 5 – Summary of 1998 Domestic Freight To and From Hampton Roads by Rail – Excluding Coal

Inbound Freight

Origination Census Division	Non-containerized	Containerized	Total Tonnage (Short Tons)	Percent
New England	0	0	0	0.0%
Middle Atlantic	57,114	0	57,114	0.7%
East North Central	559,854	1,208,190	1,768,044	22.4%
West North Central	6,066	154,128	160,194	2.0%
South Atlantic	4,938,575	161,198	5,099,773	64.5%
East South Central	101,958	328,094	430,052	5.4%
West South Central	35,188	27,138	62,326	0.8%
Mountain	7,950	0	7,950	0.1%
Pacific	3,996	27,020	31,016	0.4%
Unknown*	285,858	760	286,618	3.6%
Grand Total	5,996,560	1,906,528	7,903,088	
Percent	75.9%	24.1%		

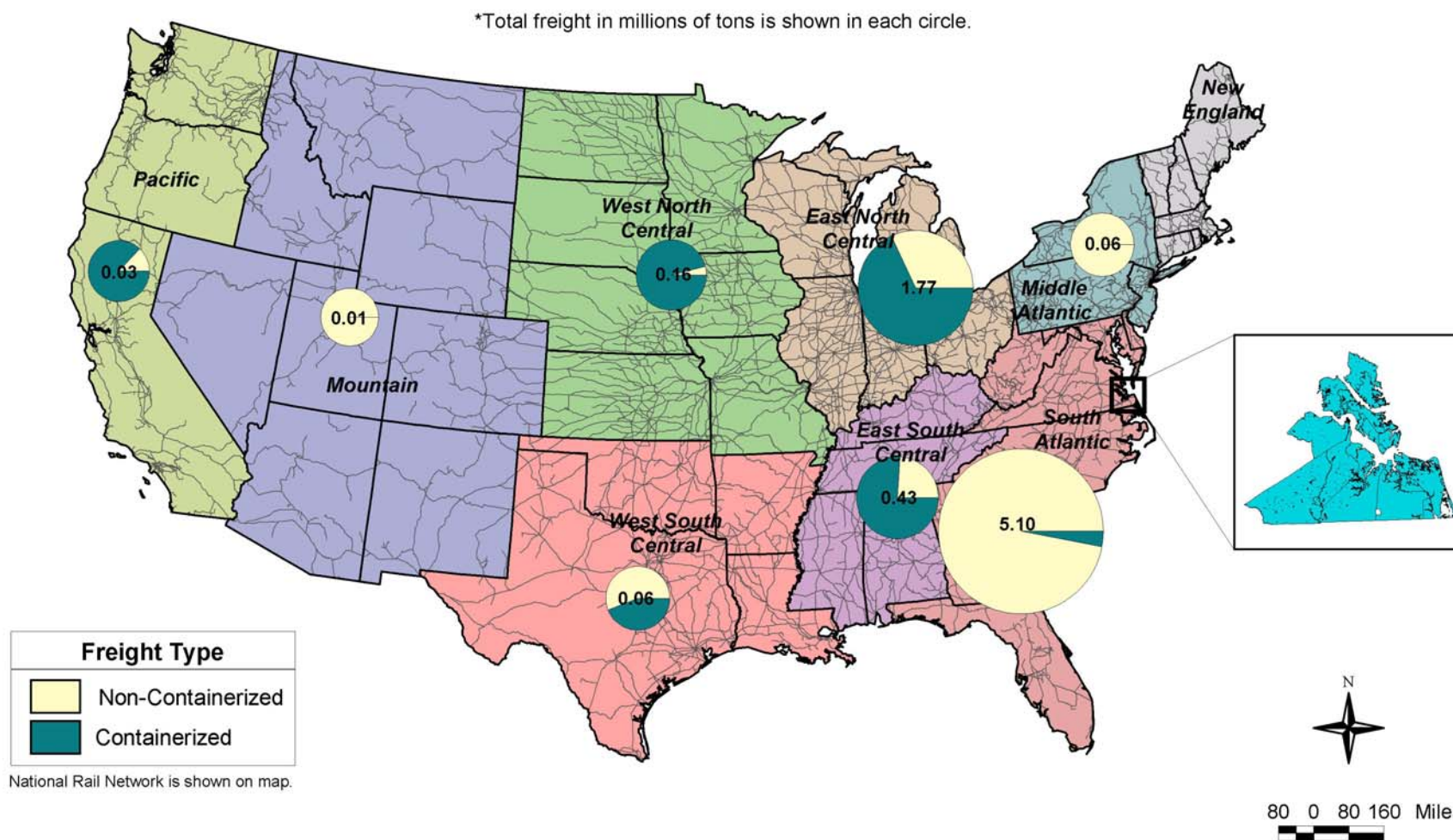
Outbound Freight

Destination Census Division	Non-containerized	Containerized	Total Tonnage (Short Tons)	Percent
New England	11456	600	12,056	0.4%
Middle Atlantic	310,492	2,722	313,214	9.2%
East North Central	272,758	971,236	1,243,994	36.5%
West North Central	0	115,106	115,106	3.4%
South Atlantic	576,117	143,636	719,753	21.1%
East South Central	108,201	139,896	248,097	7.3%
West South Central	31,183	25,524	56,707	1.7%
Mountain	0	0	0	0.0%
Pacific	29,248	9,574	38,822	1.1%
Unknown*	564,932	91,124	656,056	19.3%
Grand Total	1,904,385	1,499,418	3,403,803	
Percent	55.9%	44.1%		

Source: Reebie Associates Transearch Database.

*The Transearch Database contained some rail freight movements with unknown U.S. origins or destinations.

Map 7
Summary of 1998 Inbound Freight from U.S. Census Divisions to Hampton Roads by Rail
(Excluding Coal)

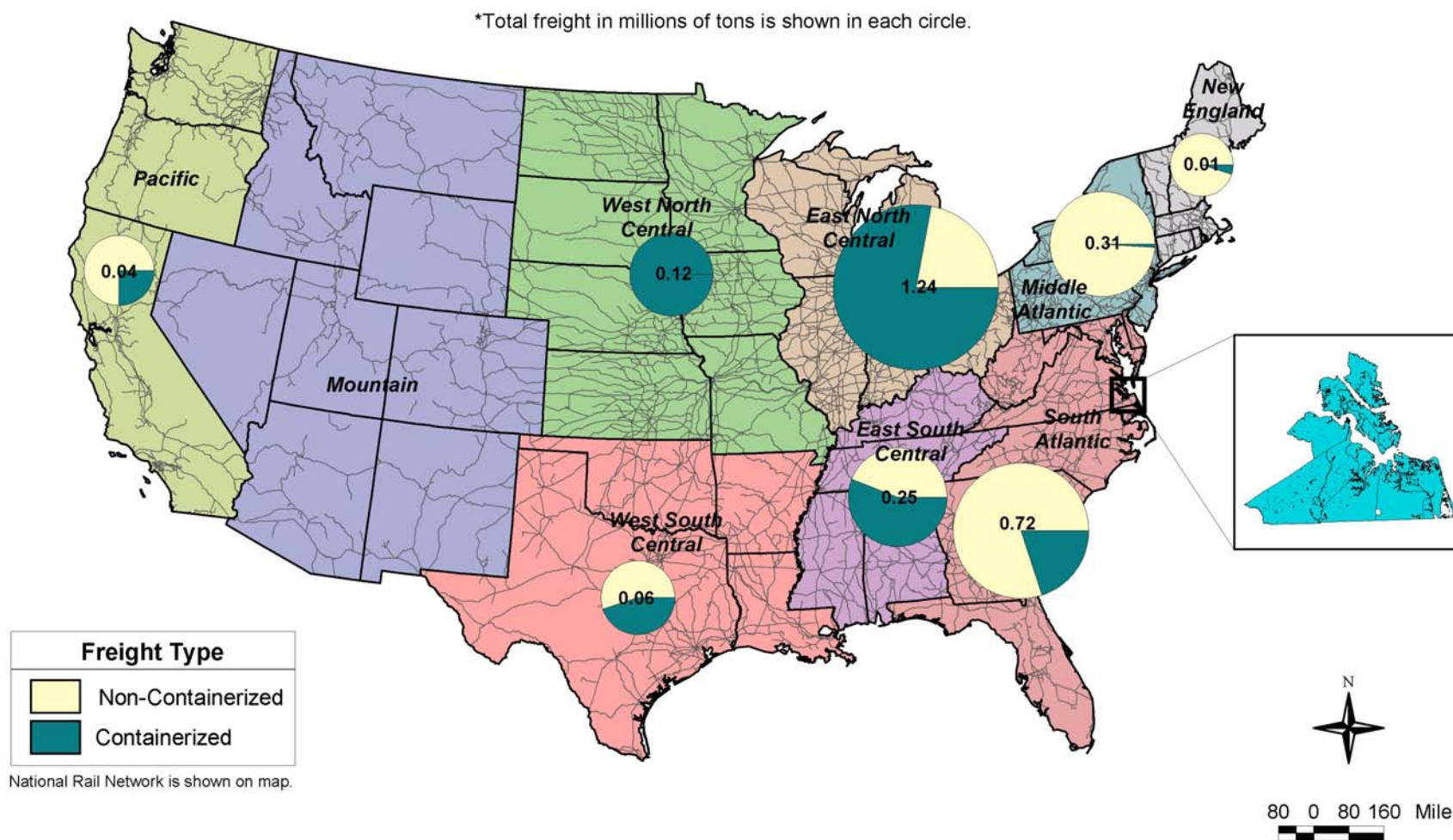


Prepared by: Hampton Roads Planning District Commission, September 2001.

Base map source: ESRI

Data source: Reebie Associates Transearch Database (Note: 0.29 million tons of freight transported by rail had an unknown U.S. origin due to unavailable data)

Map 8
Summary of 1998 Outbound Freight from Hampton Roads to U.S. Census Divisions by Rail
(Excluding Coal)



Prepared by: Hampton Roads Planning District Commission, September 2001.
Base map source: ESRI
Data source: Reebie Associates Transearch Database (Note: 0.66 million tons of freight transported by rail had an unknown U.S. destination due to unavailable data)

STATEWIDE FREIGHT MOVEMENT IN AND OUT OF HAMPTON ROADS

Freight traffic to and from Virginia destinations plays a significant role in the total domestic freight movement for Hampton Roads. According to 1998 data Virginia origination points account for approximately 41% of total domestic freight to Hampton Roads, and Virginia destination points account for approximately 45% of total domestic freight from the Hampton Roads Planning District⁵ (**Figure 15**).

For the purpose of this analysis, the state of Virginia was analyzed using the 21 Planning District Commissions (PDCs). Each PDC was analyzed to determine the exact freight transportation relationship with Hampton Roads. For a complete breakdown of what localities comprise each Virginia PDC, see **Appendix B. Table 6** on page 24 shows the top ten freight commodities by tonnage from or to other Virginia PDCs. The inbound commodities are dominated by coal, which represents 44% of total Virginia inbound freight, and is brought into the area primarily by rail. The next most significant inbound commodity is miscellaneous waste or scrap, representing 13% of total inbound freight from Virginia PDCs in 1998, and is brought into the Hampton Roads PDC exclusively by ship according to the Reebie Associates Transearch Database. For outbound freight, warehouse and distribution center commodities command the greatest share of freight routed to Virginia PDCs with 30% of the total. None of the other top ten outbound freight commodities account for more than 8% of Hampton Roads freight bound for Virginia destinations. Overall, the top ten inbound and outbound commodities account for 81% and 68% of total freight traffic between Hampton Roads and other Virginia PDCs respectively.

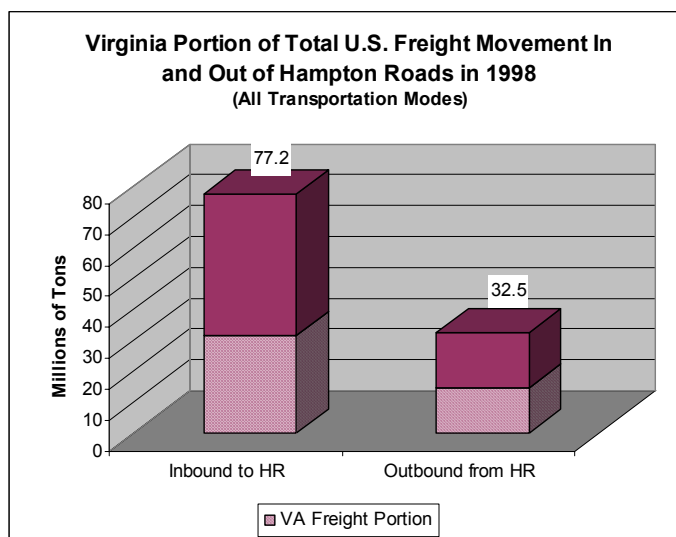


FIGURE 15 – Virginia Portion of Total U.S. Freight movement In and Out of Hampton Roads Planning District.
Source: Reebie Associates Transearch Database

⁵ Jurisdictions included in the Hampton Roads Planning District statewide freight movement analysis were: Norfolk, Portsmouth, Virginia Beach, Chesapeake, Suffolk, Newport News, Hampton, Franklin, Poquoson, Isle of Wight, James City, Southampton, Williamsburg, and York. Portions of Surry and Gloucester are included in the Hampton Roads Planning District Commission, but have been assigned to the PDCs of Crater and Middle Peninsula respectively. One other locality, Chesterfield, is located within two PDCs and was assigned to Richmond Regional PDC for this study.

TABLE 6 – 1998 Top Ten Inbound and Outbound Commodities for Hampton Roads To and From Other Virginia PDCs

Inbound Freight							
Commodity	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent of Total Inbound	Commodity Value
BITUMINOUS COAL	13,318,783	594,867	0	0	13,913,650	44%	\$365,016,715
MISC WASTE OR SCRAP	0	0	0	4,066,953	4,066,953	13%	\$27,802,989,694
WAREHOUSE & DISTRIBUTION CENTER	0	1,995,806	0	0	1,995,806	6%	N/A
BROKEN STONE OR RIPRAP	1,211,836	0	0	426,821	1,638,657	5%	\$9,135,283
READY-MIX CONCRETE, WET	0	948,460	0	0	948,460	3%	\$5,287,529
PRIMARY FOREST MATERIALS	0	840,100	0	0	840,100	3%	\$27,207,394
GRAVEL OR SAND	0	0	0	619,007	619,007	2%	\$44,464,204
NONMETALLIC MINERALS	612,207	0	0	0	612,207	2%	\$3,474,693
PETROLEUM REFINING PRODUCTS	0	2,057	0	594,799	596,856	2%	\$24,071,537
RAIL INTERMODAL DRAYAGE	0	337,597	0	0	337,597	1%	\$83,434,209
Subtotaled Tonnage for the Top 10 Commodities					25,569,292		
Total Tonnage Transported					31,580,524		
Outbound Freight							
Commodity	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent of Total Outbound	Commodity Value
WAREHOUSE & DISTRIBUTION CENTER	0	4,428,214	0	0	4,428,214	30%	N/A
GRAVEL OR SAND	0	0	0	1,237,145	1,237,145	8%	\$7,021,647
BROKEN STONE OR RIPRAP	0	0	0	855,035	855,035	6%	\$4,766,700
READY-MIX CONCRETE, WET	0	841,640	0	0	841,640	6%	\$27,257,264
PETROLEUM REFINING PRODUCTS	0	1,990	0	751,823	753,813	5%	\$186,298,430
MISC WASTE OR SCRAP	0	0	0	555,522	555,522	4%	\$3,797,725,826
MOTOR VEHICLE PARTS OR ACCESSORIES	0	383,905	0	0	383,905	3%	\$1,258,948,116
CONCRETE PRODUCTS	0	326,701	0	0	326,701	2%	\$32,939,066
PRIMARY FOREST MATERIALS	0	319,552	0	0	319,552	2%	\$22,953,901
POTASSIUM OR SODIUM COMPOUND	3,982	276,075	0	3,401	283,458	2%	\$70,685,845
Subtotaled Tonnage for the Top 10 Commodities					9,984,985		
Total Tonnage Transported					14,640,760		

Source: Transearch Database, Reebie Associates

This analysis also includes a detailed check of the Hampton Roads freight relationship with each of Virginia's PDCs. Data showing how much freight is sent to and received from every other Virginia PDC was compiled using the Reebie Associates Transearch Database.

In **Table 7** on page 25, the analysis shows a breakdown of freight traffic between Hampton Roads and each Virginia PDC in 1998. A majority of freight transported to Hampton Roads from other Virginia PDCs originated in: Cumberland Plateau (37.7%), Crater (15.4%), and Lenowisco (12.4%) PDCs. Freight from Hampton Roads goes primarily to: Northern Virginia (46.6%), Cumberland Plateau (12.0%), and Richmond Regional (9.3%) PDCs.

Table 7 also shows the modal distribution of inbound and outbound freight between Hampton Roads and other Virginia PDCs. The analysis found that most inbound freight was transported by rail, which is a result of the large percentage of coal shipped into the area. Most individual PDC's freight shipments to Hampton Roads are dominated by truck traffic. Freight from Hampton Roads to other PDCs is also primarily truck traffic, which accounts for 68.9% of freight to Virginia PDCs. **Maps 9** and **10** on pages 26 and 27 offer a visual breakdown of the freight relationships with other PDCs by mode.

TABLE 7 – Summary of 1998 Inbound and Outbound Freight Between Hampton Roads and each Virginia PDC

Inbound Freight							
VAPDC Number	VAPDC Name	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent
1	Lenowisco	3,870,124	46,336	0	0	3,916,461	12.4%
2	Cumberland Plateau	10,939,859	958,505	0	0	11,898,364	37.7%
3	Mount Rogers	0	1,221,151	0	0	1,221,151	3.9%
4	New River Valley	42,688	203,578	0	0	246,266	0.8%
5	Roanoke Valley-Alleghany	3,800	439,971	0	0	443,771	1.4%
6	Central Shenandoah	0	559,581	0	0	559,581	1.8%
7	Northern Shenandoah	104,918	165,901	0	0	270,819	0.9%
8	Northern Virginia	0	694,040	0	313,611	1,007,651	3.2%
9	Rappahannock-Rapidan	7,392	65,592	0	0	72,984	0.2%
10	Thomas Jefferson	0	78,939	0	0	78,939	0.2%
11	Central Virginia	0	479,563	0	0	479,563	1.5%
12	West Piedmont	0	469,224	0	0	469,224	1.5%
13	Southside	1,102,970	63,524	0	0	1,166,494	3.7%
14	Piedmont	0	98,139	0	0	98,139	0.3%
15	Richmond Regional	1,689,806	911,949	77	52,646	2,654,478	8.4%
16	RADCO	0	62,827	0	0	62,827	0.2%
17	Northern Neck	0	46,502	0	562	47,064	0.1%
18	Middle Peninsula	55,696	115,393	0	1,037	172,126	0.5%
19	Crater	498,594	317,024	0	4,041,197	4,856,815	15.4%
22	Accomack-Norhampton	0	252,790	0	1,605,020	1,857,810	5.9%
Grand Total		18,315,847	7,250,527	77	6,014,073	31,580,524	
Modal Split Percent		58.0%	23.0%	0.0%	19.0%		

Source: Transearch Database, Reebie Associates

Outbound Freight							
VAPDC Number	VAPDC Name	Rail	Truck	Air	Water	Total Tonnage (Short Tons)	Percent
1	Lenowisco	0	60,552	0	0	60,552	0.4%
2	Cumberland Plateau	0	1,750,001	0	0	1,750,001	12.0%
3	Mount Rogers	0	571,441	0	0	571,441	3.9%
4	New River Valley	11,720	287,893	0	0	299,613	2.0%
5	Roanoke Valley-Alleghany	49,715	350,166	0	0	399,881	2.7%
6	Central Shenandoah	0	640,632	0	0	640,632	4.4%
7	Northern Shenandoah	57,914	196,161	0	0	254,075	1.7%
8	Northern Virginia	0	2,663,817	2	4,153,225	6,817,044	46.6%
9	Rappahannock-Rapidan	11,182	43,473	0	0	54,655	0.4%
10	Thomas Jefferson	0	163,948	0	0	163,948	1.1%
11	Central Virginia	0	812,301	0	0	812,301	5.5%
12	West Piedmont	3,824	426,115	0	0	429,939	2.9%
13	Southside	0	85,273	0	0	85,273	0.6%
14	Piedmont	0	91,045	0	0	91,045	0.6%
15	Richmond Regional	17,442	1,207,096	6	138,740	1,363,285	9.3%
16	RADCO	0	46,657	0	0	46,657	0.3%
17	Northern Neck	0	56,310	0	0	56,310	0.4%
18	Middle Peninsula	0	80,638	0	1,030	81,668	0.6%
19	Crater	22,383	170,512	0	70,160	263,055	1.8%
22	Accomack-Norhampton	0	378,070	0	21,314	399,384	2.7%
Grand Total		174,181	10,082,103	8	4,384,469	14,640,760	
Modal Split Percent		1.2%	68.9%	0.0%	29.9%		

Source: Transearch Database, Reebie Associates

Map 9

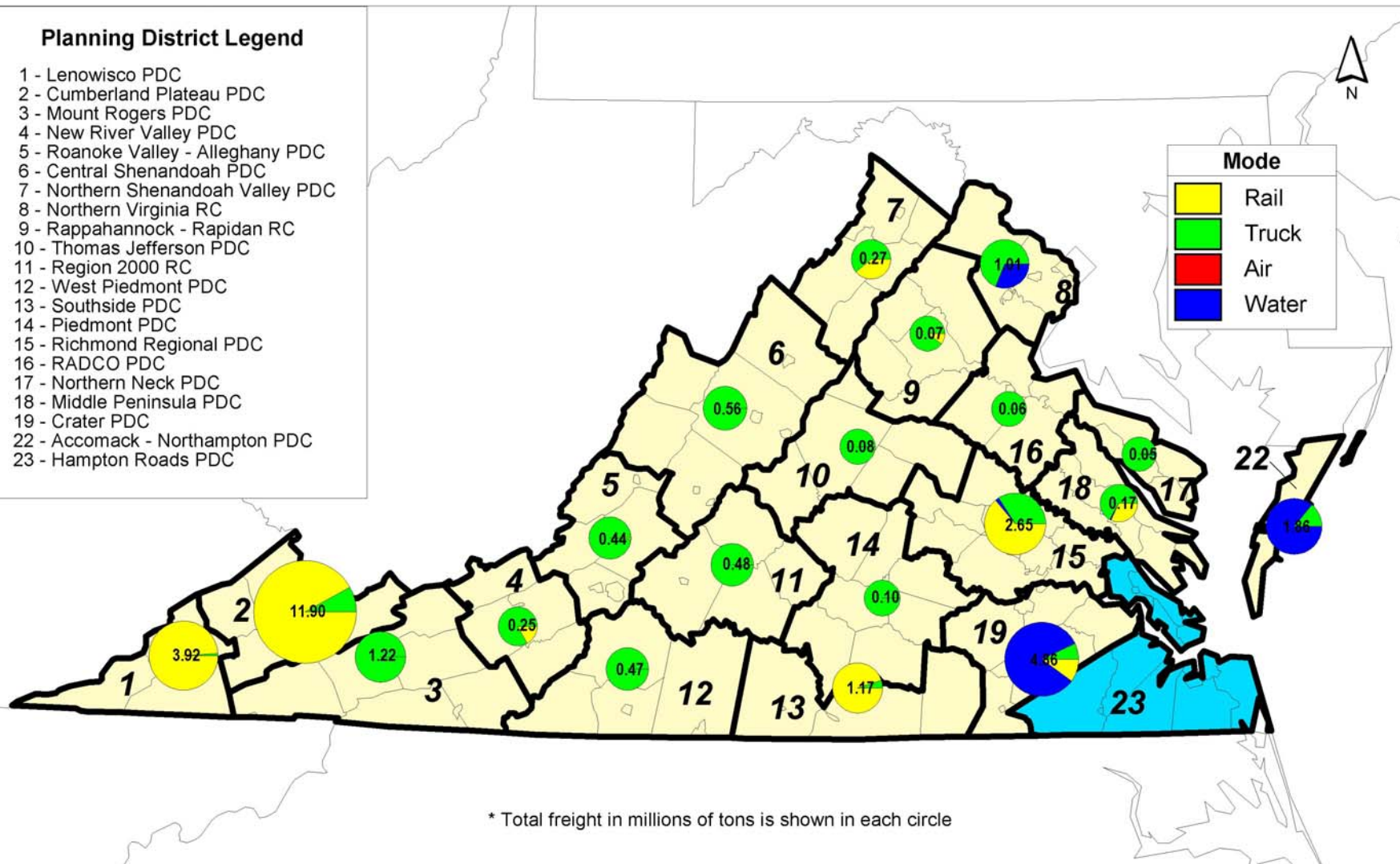
Summary of 1998 Inbound Freight from Virginia Planning Districts to Hampton Roads by Mode

Planning District Legend

- 1 - Lenowisco PDC
- 2 - Cumberland Plateau PDC
- 3 - Mount Rogers PDC
- 4 - New River Valley PDC
- 5 - Roanoke Valley - Alleghany PDC
- 6 - Central Shenandoah PDC
- 7 - Northern Shenandoah Valley PDC
- 8 - Northern Virginia RC
- 9 - Rappahannock - Rapidan RC
- 10 - Thomas Jefferson PDC
- 11 - Region 2000 RC
- 12 - West Piedmont PDC
- 13 - Southside PDC
- 14 - Piedmont PDC
- 15 - Richmond Regional PDC
- 16 - RADCO PDC
- 17 - Northern Neck PDC
- 18 - Middle Peninsula PDC
- 19 - Crater PDC
- 22 - Accomack - Northampton PDC
- 23 - Hampton Roads PDC

Mode

- Rail
- Truck
- Air
- Water



Prepared by: Hampton Roads Planning District Commission, August 2001
 Base map source: ESRI
 Data source: Reebie Associates Transearch Database

Note: Chesterfield was assigned to PDC 15, Gloucester to PDC 18, and Surry to PDC 19

Map 10

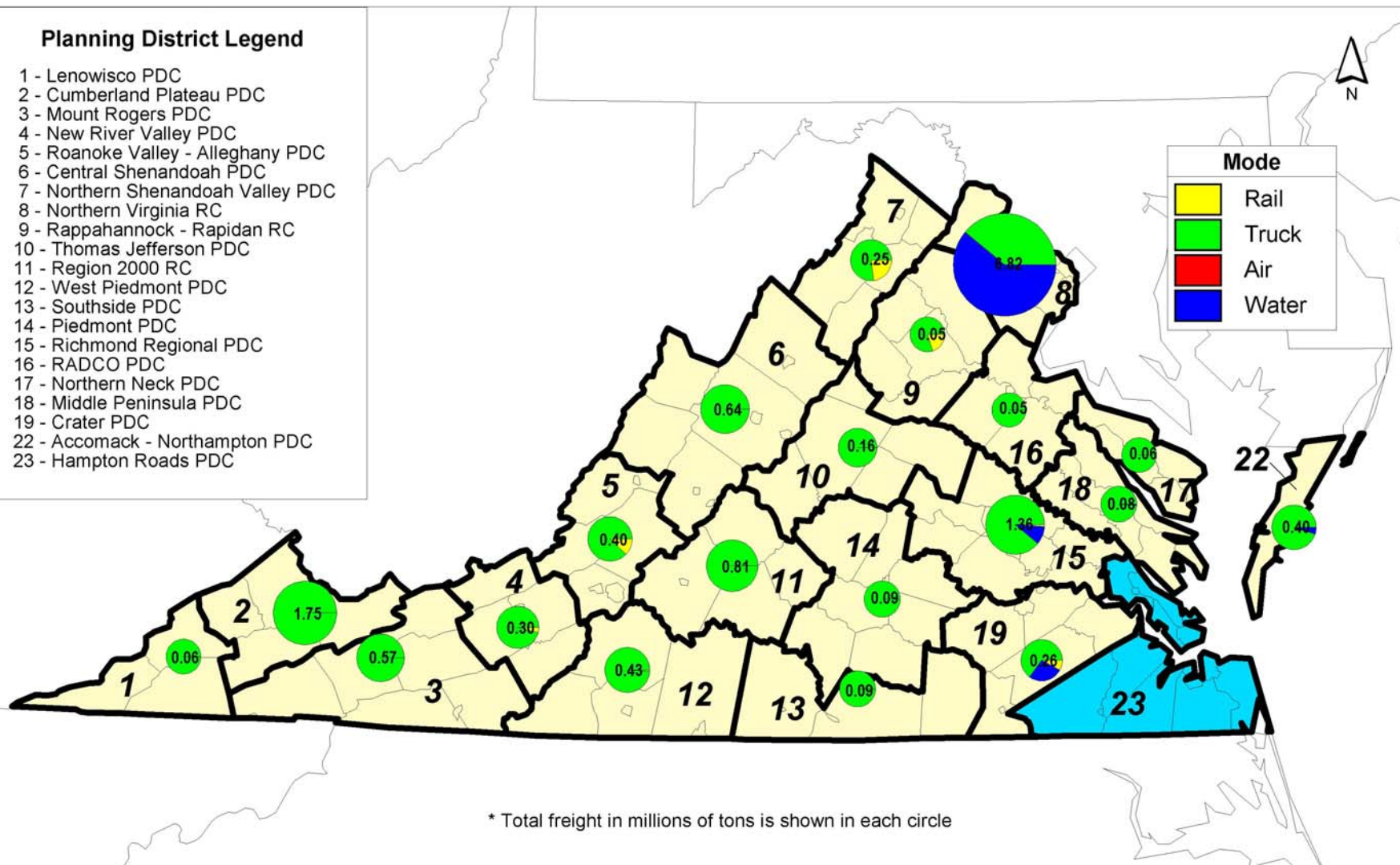
Summary of 1998 Outbound Freight from Hampton Roads to Virginia Planning Districts by Mode

Planning District Legend

- 1 - Lenowisco PDC
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- 7 - Northern Shenandoah Valley PDC
- 8 - Northern Virginia RC
- 9 - Rappahannock - Rapidan RC
- 10 - Thomas Jefferson PDC
- 11 - Region 2000 RC
- 12 - West Piedmont PDC
- 13 - Southside PDC
- 14 - Piedmont PDC
- 15 - Richmond Regional PDC
- 16 - RADCO PDC
- 17 - Northern Neck PDC
- 18 - Middle Peninsula PDC
- 19 - Crater PDC
- 22 - Accomack - Northampton PDC
- 23 - Hampton Roads PDC

Mode

- Rail
- Truck
- Air
- Water



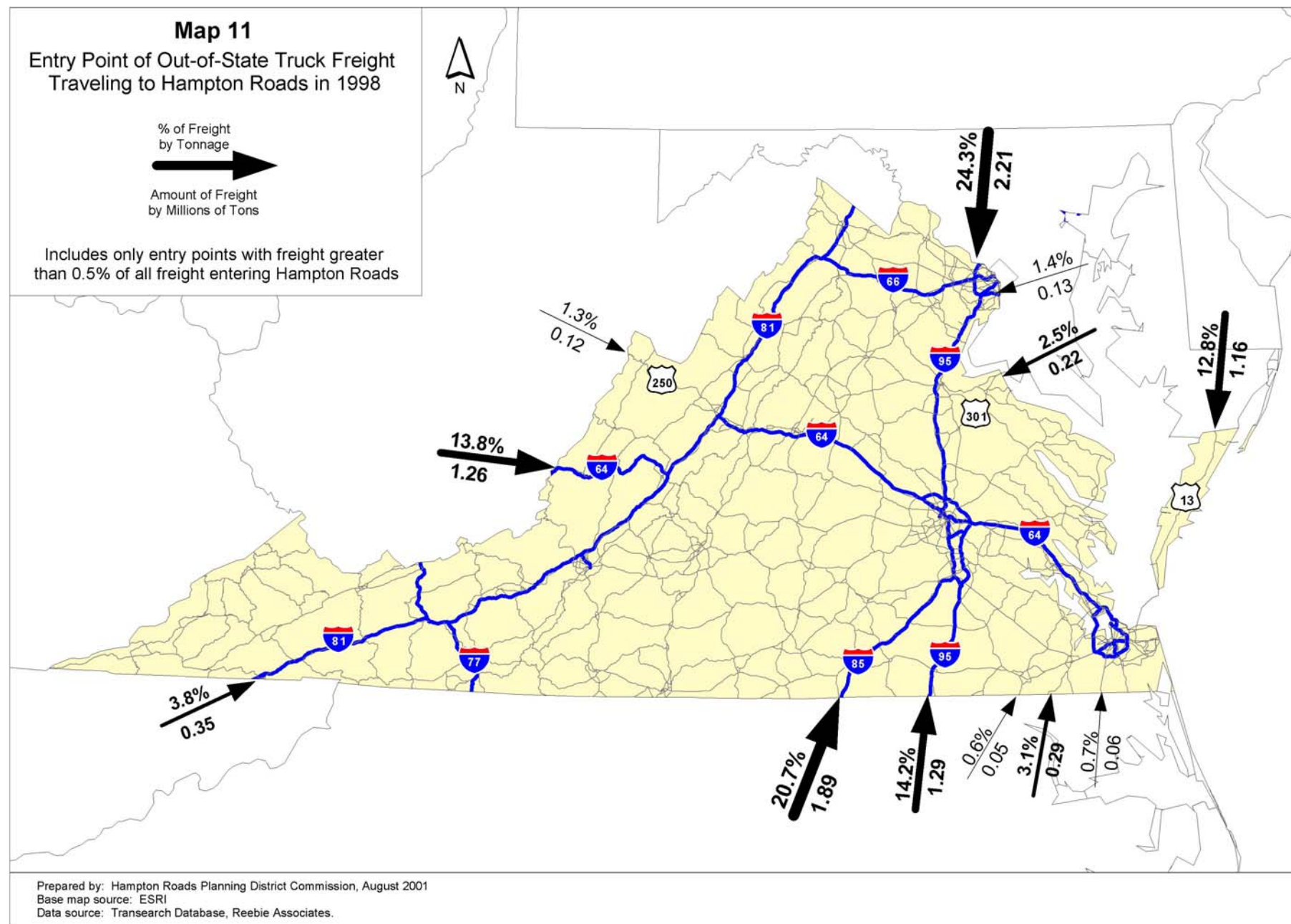
Prepared by: Hampton Roads Planning District Commission, August 2001
 Base map source: ESRI
 Data source: Reebie Associates Transearch Database

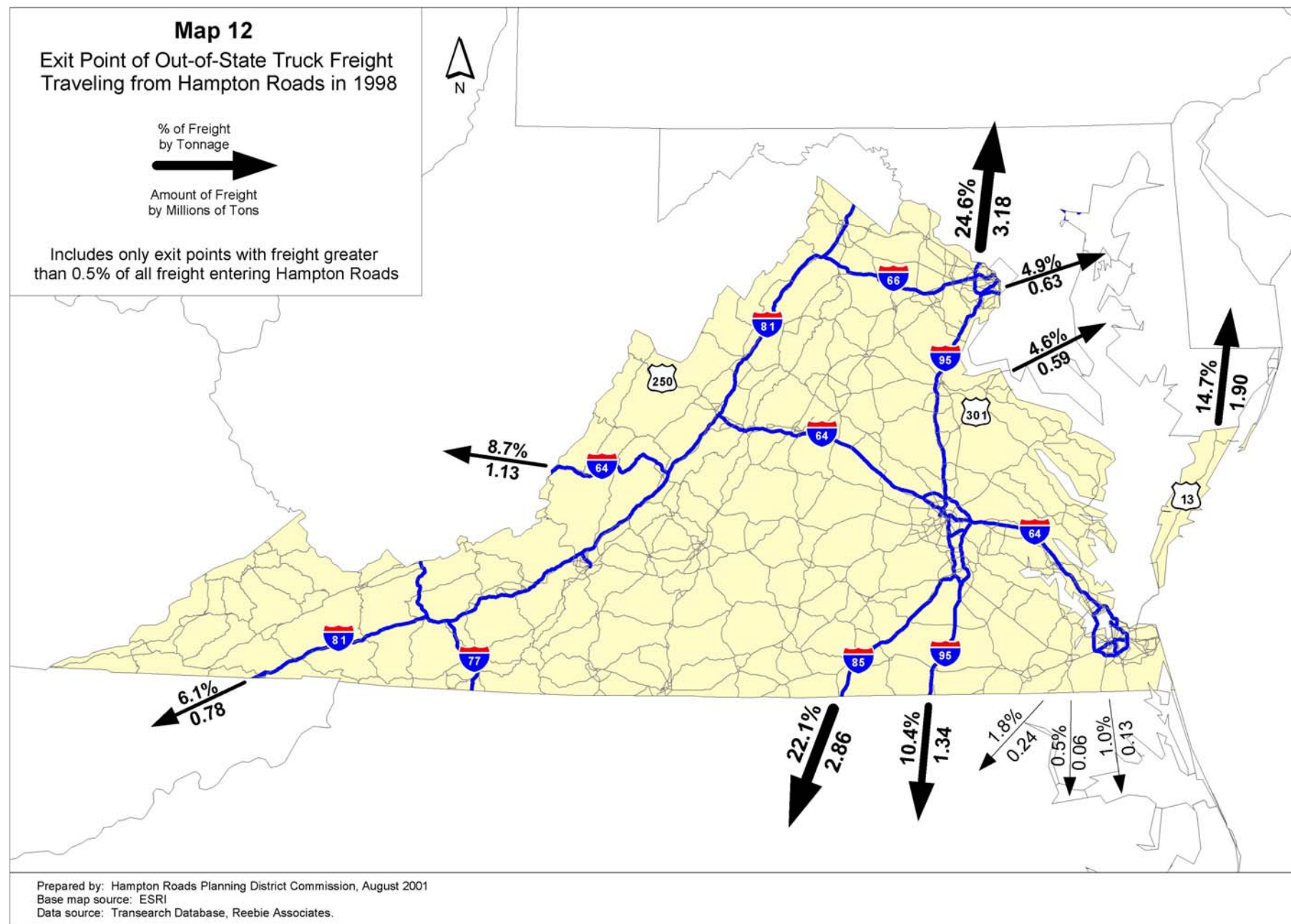
Note: Chesterfield was assigned to PDC 15, Gloucester to PDC 18, and Surry to PDC 19

After analyzing the relationships between the Virginia PDCs it is important to examine how transportation of truck freight can impact those PDC's transportation systems, as it is inbound to and outbound from Hampton Roads. A clear understanding of what routes are most used in the movement of truck freight can more easily facilitate cooperation of facility planning between PDCs. This is in addition to helping the Hampton Roads area plan for transportation impacts that are more localized. This analysis studied Hampton Roads freight data to determine where outside freight is entering the State of Virginia en route to Hampton Roads, and also where outbound freight from Hampton Roads is leaving the Commonwealth. By determining the main routes for freight inbound to and outbound from Hampton Roads, a clearer picture is obtained of exactly which arteries are most important to facilitating Hampton Roads freight transportation.

Map 11 on page 29 shows the entry points for out-of-state truck freight inbound to Hampton Roads. This map clearly shows that the primary entry point to Virginia for freight heading for the Hampton Roads area is I-95, which combined (Southbound in Northern Virginia via I-495 & Northbound in Southern Virginia) accounts for 40% of truck freight heading to Hampton Roads from outside the state of Virginia. Other significant inbound arteries include I-85, I-64, and US 13 for traffic entering Virginia traveling to Hampton Roads.

Map 12 on page 30 shows the exit points for truck freight outbound from Hampton Roads to a destination outside the state of Virginia. Once again, this truck traffic is dominated by the use of I-95, which accounts for 40% of truck freight leaving Hampton Roads with a destination outside Virginia. I-85, I-64, and US 13 are the other primary routes for truck traffic traveling from Hampton Roads to out-of-state locations.





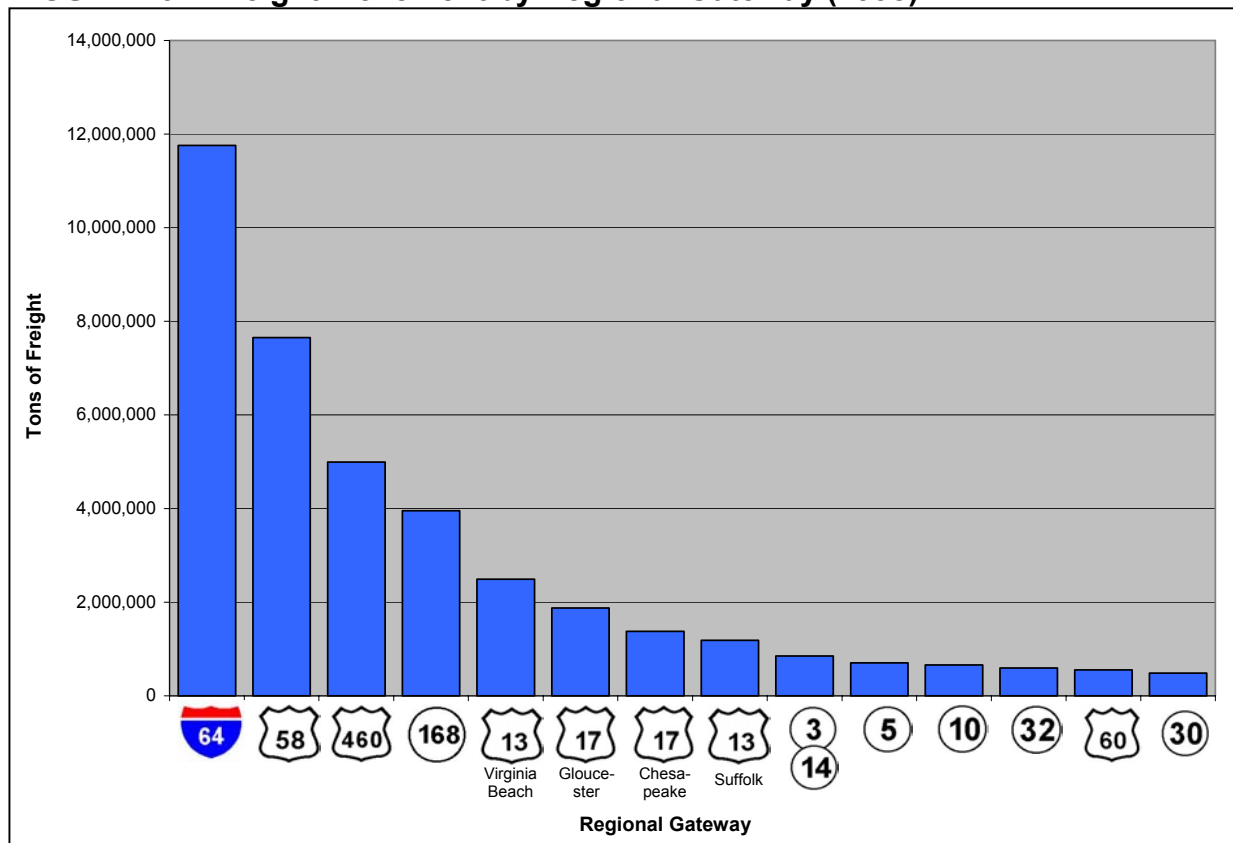
LOCAL FREIGHT MOVEMENT IN HAMPTON ROADS

While moving goods quickly and efficiently in and out of Hampton Roads is essential to the region's economic success, moving freight within Hampton Roads is also critical. A majority of the region's freight movement is by truck on a roadway network that is influenced and often hindered by the area's unique topography. This section will examine which "gateways" trucks use to enter and exit the region, the amount and type of freight that crosses between the Southside and Peninsula, and the roadways used to cross the Hampton Roads harbor.

Freight Movement Through Regional Gateways

Including coal, approximately 21% of all domestic freight entering Hampton Roads and 71% of all freight exiting Hampton Roads was transported by truck in 1998. Due to the topography of the region, surface transportation alternatives into and out of Hampton Roads are somewhat limited. Fourteen roadways were classified as "gateways" to the region for this study. **Map 13** on page 33 and **Table 8** on page 32 show the daily traffic counts, daily truck percentages, and estimated amount of freight moved by truck through these gateways. **Figure 16** shows the amount of freight entering and exiting through each gateway. I-64 carries the most domestic freight into and out of the region, followed by Route 58 and Route 460.

FIGURE 16 – Freight Movement by Regional Gateway (1998)



Sources: Virginia Department of Transportation, Transearch Database, Reebie Associates.

TABLE 8 – Estimated Freight Movement By Truck Through The Regional Gateways (1998)

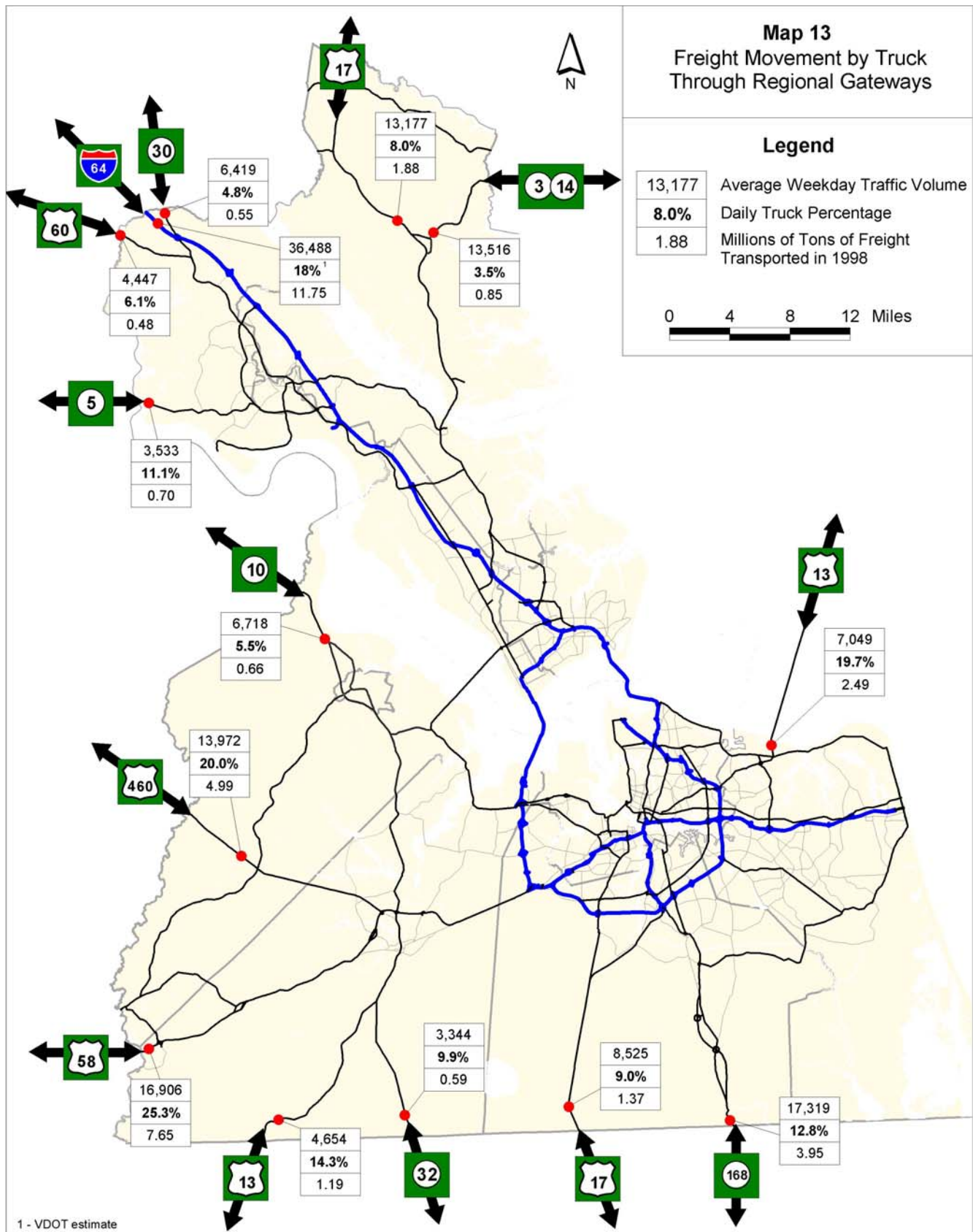
Regional Gateway	Average Weekday Traffic Volume	Daily Truck Percentage	Average Weekday Truck Volume	Estimated Share Of Truck Traffic At The Gateways	Estimated Tons Of Freight Moved By Truck In 1998
I-64 in James City County	36,488	18% ¹	6,568	30.0%	11,754,314
Route 58 in Suffolk	16,906	25.3%	4,277	19.6%	7,654,263
Route 460 in Isle of Wight County	13,972	20.0%	2,791	12.8%	4,994,868
Route 168 in Chesapeake	17,319	12.8%	2,209	10.1%	3,953,301
US 13/Chesapeake Bay Bridge-Tunnel	7,049	19.7%	1,391	6.4%	2,489,381
US 17 in Gloucester County	13,177	8.0%	1,048	4.8%	1,875,536
Route 17 in Chesapeake	8,525	9.0%	768	3.5%	1,374,439
Route 13 in Suffolk	4,654	14.3%	664	3.0%	1,188,317
Routes 3/14 in Gloucester County	13,516	3.5%	475	2.2%	850,076
Route 5 in James City County	3,533	11.1%	392	1.8%	701,536
Route 10 in Isle of Wight County	6,718	5.5%	370	1.7%	662,164
Route 32 in Suffolk	3,344	9.9%	332	1.5%	594,158
Route 30 in James City County	6,419	4.8%	309	1.4%	552,997
Route 60 in James City County	4,447	6.1%	270	1.2%	483,201
Estimated Total Daily Truck Traffic At The Regional Gateways			21,864	Total Tons Of Freight ² Transported By Truck In 1998	39,128,552

1 – VDOT estimate

2 – Total tons of freight transported by truck in 1998 includes coal.

Prepared by: Hampton Roads Planning District Commission, September 2001.

Sources: Virginia Department of Transportation, Transearch Database, Reebie Associates.



Prepared by: Hampton Roads Planning District Commission, August 2001.
Base map source: Virginia Department of Transportation.
Data sources: Virginia Department of Transportation, Transearch Database, Reebie Associates.

Freight Movements Within Hampton Roads

While the Hampton Roads region is a significant player in the national and worldwide freight trade, a significant amount of the freight trade occurs within Hampton Roads. **Table 9** shows that approximately 5.3 million tons of freight moved within the Hampton Roads region in 1998. Of that total, 1.6 million tons, or 31%, was transported between the Southside and Peninsula. 54% of all freight transported between the Southside and Peninsula was transported by water, thereby avoiding the traffic congestion at regional water crossings.

TABLE 9 – Short Tons of Freight Moved Within Hampton Roads (1998)

Movement	Total Tonnage Moved By Water	Total Tonnage Moved By Truck	Total Tonnage
Southside to Peninsula	353,820	446,796	800,616
Southside to Southside	1,016,125	2,144,883	3,161,008
Peninsula to Southside	519,696	298,770	818,466
Peninsula to Peninsula	173,456	306,459	479,915
Totals	2,063,097	3,196,908	5,260,005

Source: Transearch Database, Reebie Associates.

Table 10 on page 35 lists the top ten commodities transported from the Southside to the Peninsula and vice-versa in 1998. The primary commodity by both weight and commodity value transported across Hampton Roads was miscellaneous scrap or waste. The primary commodity transported across Hampton Roads by truck was cargo transferred between warehouse and distribution centers.

TABLE 10 – 1998 Top Ten Commodities Transported Across Hampton Roads**Southside to Peninsula**

Commodity	Truck	Water	Total Tonnage (Short Tons)	Percent of Total Transported	Commodity Value
MISC WASTE OR SCRAP	0	254,285	254,285	32%	\$1,738,373,479
WAREHOUSE & DISTRIBUTION CENTER	156,696	0	156,696	20%	N/A
PETROLEUM REFINING PRODUCTS	0	84,920	84,920	11%	\$20,987,251
READY-MIX CONCRETE, WET	82,551	0	82,551	10%	\$2,673,478
RAIL INTERMODAL DRAYAGE	49,998	0	49,998	6%	N/A
CONCRETE PRODUCTS	27,816	0	27,816	3%	\$2,804,500
PRIMARY FOREST MATERIALS	13,886	0	13,886	2%	\$997,452
SOFT DRINKS OR MINERAL WATER	13,472	0	13,472	2%	\$6,229,733
PROCESSED MILK	11,807	0	11,807	1%	\$6,913,174
MALT LIQUORS	10,712	0	10,712	1%	\$5,463,020

Subtotaled Tonnage for the Top 10 Commodities 706,142

Total Tonnage Transported 800,616

Peninsula to Southside

Commodity	Truck	Water	Total Tonnage (Short Tons)	Percent of Total Transported	Commodity Value
PETROLEUM REFINING PRODUCTS	0	290,519	290,519	35%	\$71,799,284
MISC WASTE OR SCRAP	0	137,614	137,614	17%	\$940,773,258
WAREHOUSE & DISTRIBUTION CENTER	107,134	0	107,134	13%	N/A
MOTOR VEHICLE PARTS OR ACCESSORIES	53,983	0	53,983	7%	\$177,027,727
MISC COAL OR PETROLEUM PRODUCTS	0	53,162	53,162	6%	\$7,396,644
RAIL INTERMODAL DRAYAGE	36,664	0	36,664	4%	N/A
READY-MIX CONCRETE, WET	25,218	0	25,218	3%	\$816,710
MOTOR VEHICLES	19,341	0	19,341	2%	\$121,706,039
ASPHALT PAVING BLOCKS OR MIX	0	14,950	14,950	2%	\$572,611
PRIMARY FOREST MATERIALS	8,811	0	8,811	1%	\$632,907

Subtotaled Tonnage for the Top 10 Commodities 747,396

Total Tonnage Transported 818,466

Source: Transearch Database, Reebie Associates.

Although the Hampton Roads harbor is the primary reason for the region's prominence in freight movement, it also makes surface transportation between the Peninsula and Southside difficult. There are three facilities that connect the Peninsula and Southside of Hampton Roads: [1] The Hampton Roads Bridge-Tunnel (I-64), a four-lane facility which carries 89,000 vehicles on an average weekday; [2] the Monitor-Merrimac Memorial Bridge-Tunnel (I-664), a four-lane facility which carries 51,000 vehicles on an average weekday; and [3] the James River Bridge (US Routes 17/258), a four-lane drawbridge facility that carries 27,000 vehicles per day. These facilities, particularly the Hampton Roads Bridge-Tunnel, are often congested throughout the morning and afternoon peak periods and whenever an incident occurs on or near the roadway.



PICTURE 6 – The majority of freight moving by truck between the Southside and the Peninsula uses the Hampton Roads Bridge-Tunnel (I-64).

Traffic growth at these three crossings has been considerable in recent years. Before the Monitor-Merrimac Memorial Bridge-Tunnel opened in April 1992, 105,900 vehicles crossed Hampton Roads on the average weekday. In 2000, this number increased to 167,000 vehicles on average weekdays, a jump of 58%, or 5.2% yearly since 1991. Most of this growth is due to the Monitor-Merrimac Memorial Bridge-Tunnel, although the Hampton Roads Bridge-Tunnel and the James River Bridge experienced a 2.3% and 2.4% growth rate in traffic volumes respectively during this period.

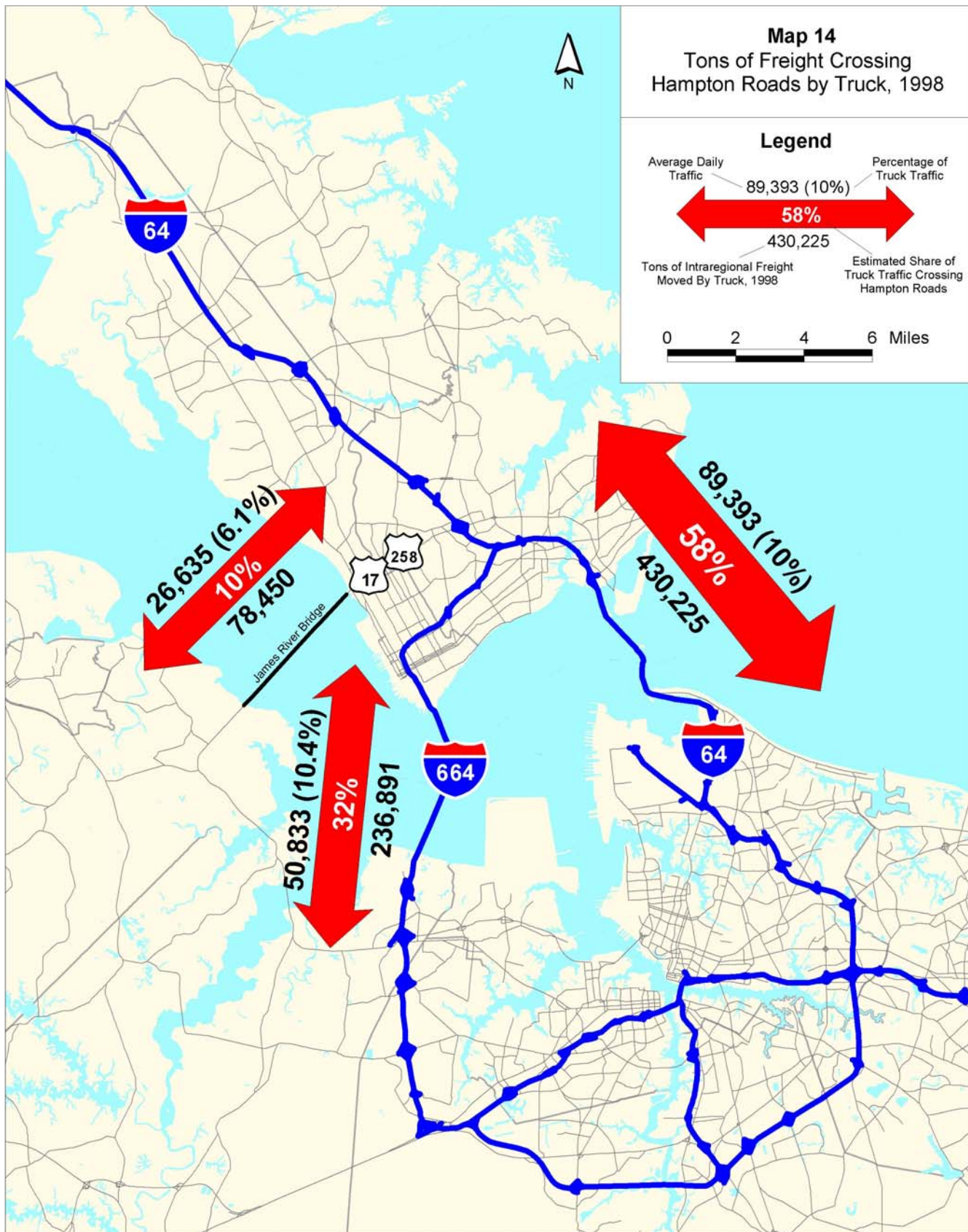
As shown in **Table 11** and in **Map 14** on page 37, the majority of the trucks moving within the region cross Hampton Roads at the Hampton Roads Bridge-Tunnel. Almost 58% of all truck traffic crossing Hampton Roads uses the Hampton Roads Bridge-Tunnel, as compared to 32% using the Monitor-Merrimac Memorial Bridge Tunnel and 10% using the James River Bridge. By assuming that the proportion of freight tonnage being transported is similar to the proportion of truck traffic crossing Hampton Roads, over 430,000 tons of intraregional freight crossed the Hampton Roads Bridge-Tunnel in 1998.

TABLE 11 – Tons of Freight Crossing Hampton Roads by Truck (1998)

Facility	Average Weekday Traffic	Share of Average Weekday Traffic	Daily Truck Percentage	Estimated Daily Truck Count	Estimated Share of Truck Traffic Crossing Hampton Roads	Estimated Tons Of Freight Moved By Truck, 1998
James River Bridge	26,635	16.0%	6.1%	1,630	10.5%	78,450
Monitor-Merrimac Memorial Bridge-Tunnel	50,833	30.5%	10.4%	4,922	31.8%	236,891
Hampton Roads Bridge-Tunnel	89,393	53.6%	10% ¹	8,939	57.7%	430,225
Total	166,861		9.3%	15,491		745,566

1 – VDOT estimate

Sources: Virginia Department of Transportation; Transearch Database, Reebie Associates.



Prepared by: Hampton Roads Planning District Commission, August 2001.
Base map source: Virginia Department of Transportation.
Data source: Reebie Associates Transearch Database, 1998.

Although a significant amount of freight movement occurs at the three Hampton Roads crossings, the majority of intraregional freight does not cross the Hampton Roads harbor. As shown in **Figure 17**, 69% of all freight that had Hampton Roads origins and destinations in 1998 remained on their respective sides of Hampton Roads.

Table 12 on page 39 lists the top ten commodities transported on the Southside and the Peninsula in 1998. 3,161,008 tons of freight were transported from Southside origins to Southside destinations in 1998. Rail intermodal drayage was the primary commodity transported by truck while miscellaneous scrap and waste was the primary commodity transported by water.

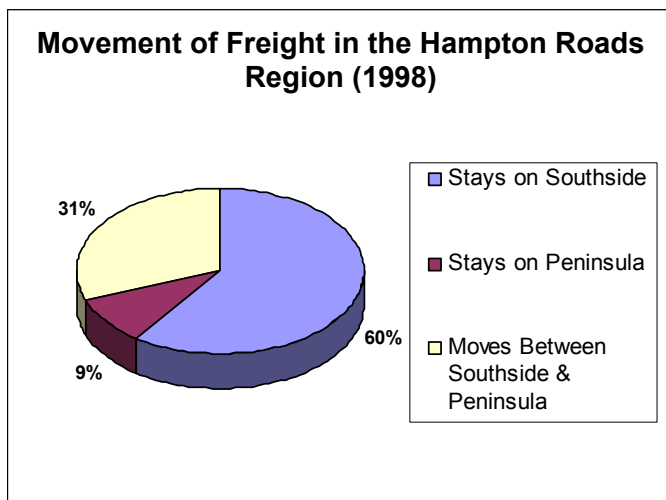


FIGURE 17 – Movement of Freight in the Hampton Roads Region (1998).

The amount of freight moving from Peninsula origins to Peninsula destinations in 1998 was 479,915 tons. Petroleum refining products was the primary commodity transported by water while motor vehicle parts and accessories and warehouse and distribution center freight were the primary commodities transported by truck.

TABLE 12 – 1998 Top Ten Commodities Transported Within Hampton Roads**Southside to Southside**

Commodity	Truck	Water	Total Tonnage (Short Tons)	Percent of Total Transported	Commodity Value
RAIL INTERMODAL DRAYAGE	840,818	0	840,818	27%	N/A
MISC WASTE OR SCRAP	0	706,229	706,229	22%	\$4,828,007,014
WAREHOUSE & DISTRIBUTION CENTER	316,265	0	316,265	10%	N/A
PETROLEUM REFINING PRODUCTS	0	237,927	237,927	8%	\$58,801,621
READY-MIX CONCRETE, WET	229,835	0	229,835	7%	\$7,443,413
NONMETAL MINERALS, PROCESSED	145,495	0	145,495	5%	\$7,874,366
CONCRETE PRODUCTS	90,601	0	90,601	3%	\$9,134,690
PRIMARY FOREST MATERIALS	37,573	0	37,573	1%	\$2,698,925
MOTOR VEHICLE PARTS OR ACCESSORIES	35,685	0	35,685	1%	\$117,022,557
SOFT DRINKS OR MINERAL WATER	35,458	0	35,458	1%	\$16,396,354

Subtotaled Tonnage for the Top 10 Commodities 2,675,886

Total Tonnage Transported 3,161,008

Peninsula to Peninsula

Commodity	Truck	Water	Total Tonnage (Short Tons)	Percent of Total Transported	Commodity Value
PETROLEUM REFINING PRODUCTS	0	134,776	134,776	28%	\$33,308,735
MOTOR VEHICLE PARTS OR ACCESSORIES	91,259	0	91,259	19%	\$299,268,226
WAREHOUSE & DISTRIBUTION CENTER	89,355	0	89,355	19%	N/A
MOTOR VEHICLES	33,366	0	33,366	7%	\$209,960,379
READY-MIX CONCRETE, WET	29,571	0	29,571	6%	\$957,683
MISC COAL OR PETROLEUM PRODUCTS	0	29,476	29,476	6%	\$4,101,115
CONCRETE PRODUCTS	8,660	0	8,660	2%	\$873,130
ELECTROMETALLURGICAL PRODUCTS	6,707	0	6,707	1%	\$6,174,827
PRIMARY FOREST MATERIALS	6,669	0	6,669	1%	\$479,044
ASPHALT PAVING BLOCKS OR MIX	0	6,341	6,341	1%	\$242,871

Subtotaled Tonnage for the Top 10 Commodities 436,181

Total Tonnage Transported 479,915

Source: Transearch Database, Reebie Associates.

REGIONAL TRUCK DATA ANALYSIS

To determine the locations with high levels of truck traffic, vehicle classification counts were taken at 147⁶ locations throughout the region (94 on the Southside, 53 on the Peninsula) between April 2000 and April 2001. Locations were chosen due to a variety of factors, including those roadways near port and warehouse facilities, military bases, high traffic roadways, and gateways to the region. Sources of these counts include VDOT interstate counts, VDOT continuous counts, and counts taken exclusively for this study. Data from each vehicle classification count location is included in **Appendix C**.

Four factors were analyzed at each count location: the daily percentage of truck traffic, the daily volume of truck traffic, the volume of truck traffic during the morning peak hour, and the volume of truck traffic during the afternoon peak hour.

Daily Truck Percentages

Map 15 on page 41 shows the daily percentage of truck traffic found at each classification count location on the Southside, and **Map 16** on page 42 shows the same information for the Peninsula.

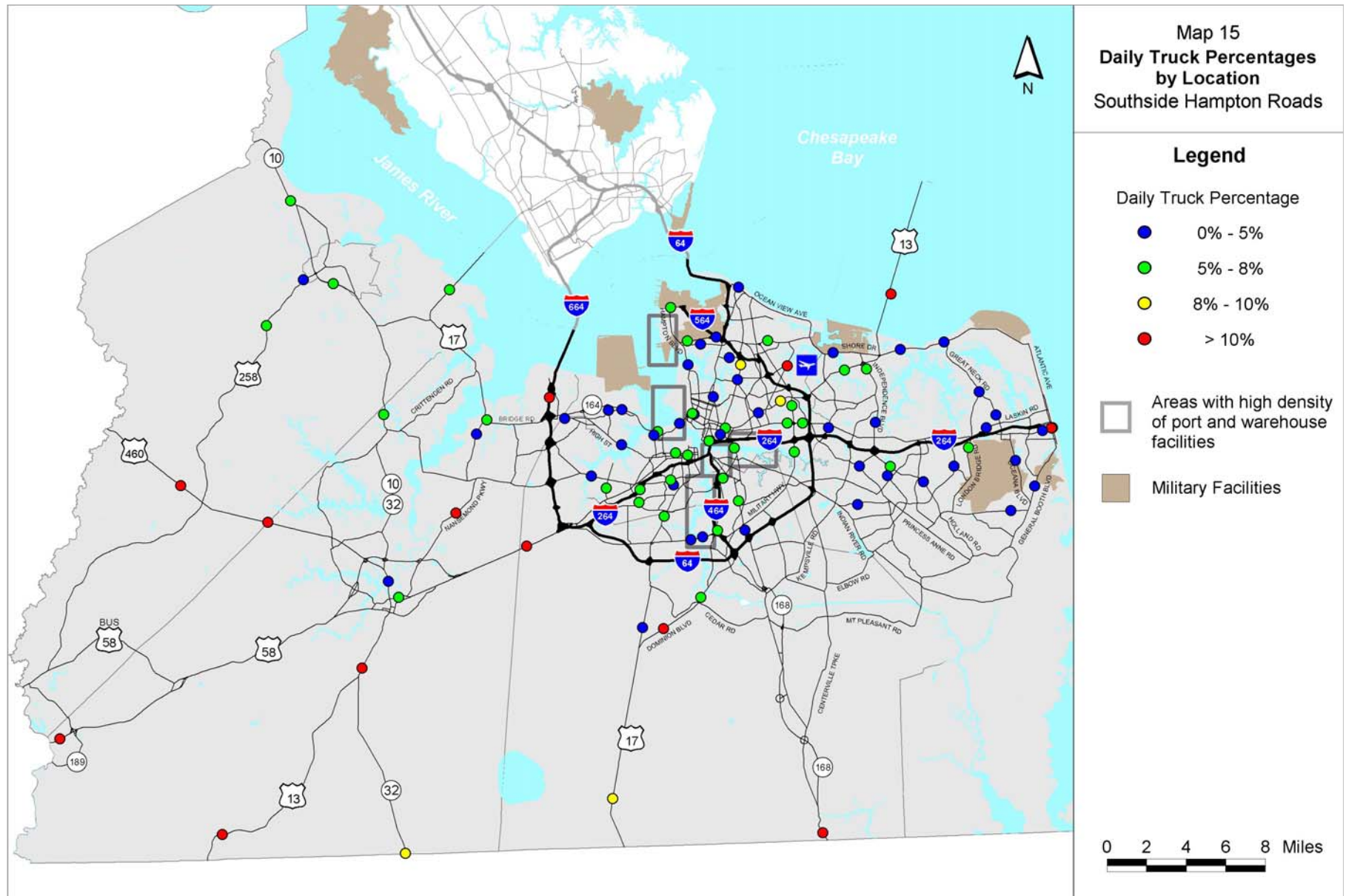
The weighted average daily truck percentage among the 147 locations is 5.2%, with a median of 4.7%. The middle 80% of the classification count locations experienced daily truck percentages between 2.6% and 9.9%. Locations with a daily truck percentage of greater than 10% were considered to have a high level of truck traffic. **Table 13** includes these locations with a high daily percentage of truck traffic.

TABLE 13 – Locations with a High Daily Percentage of Truck Traffic

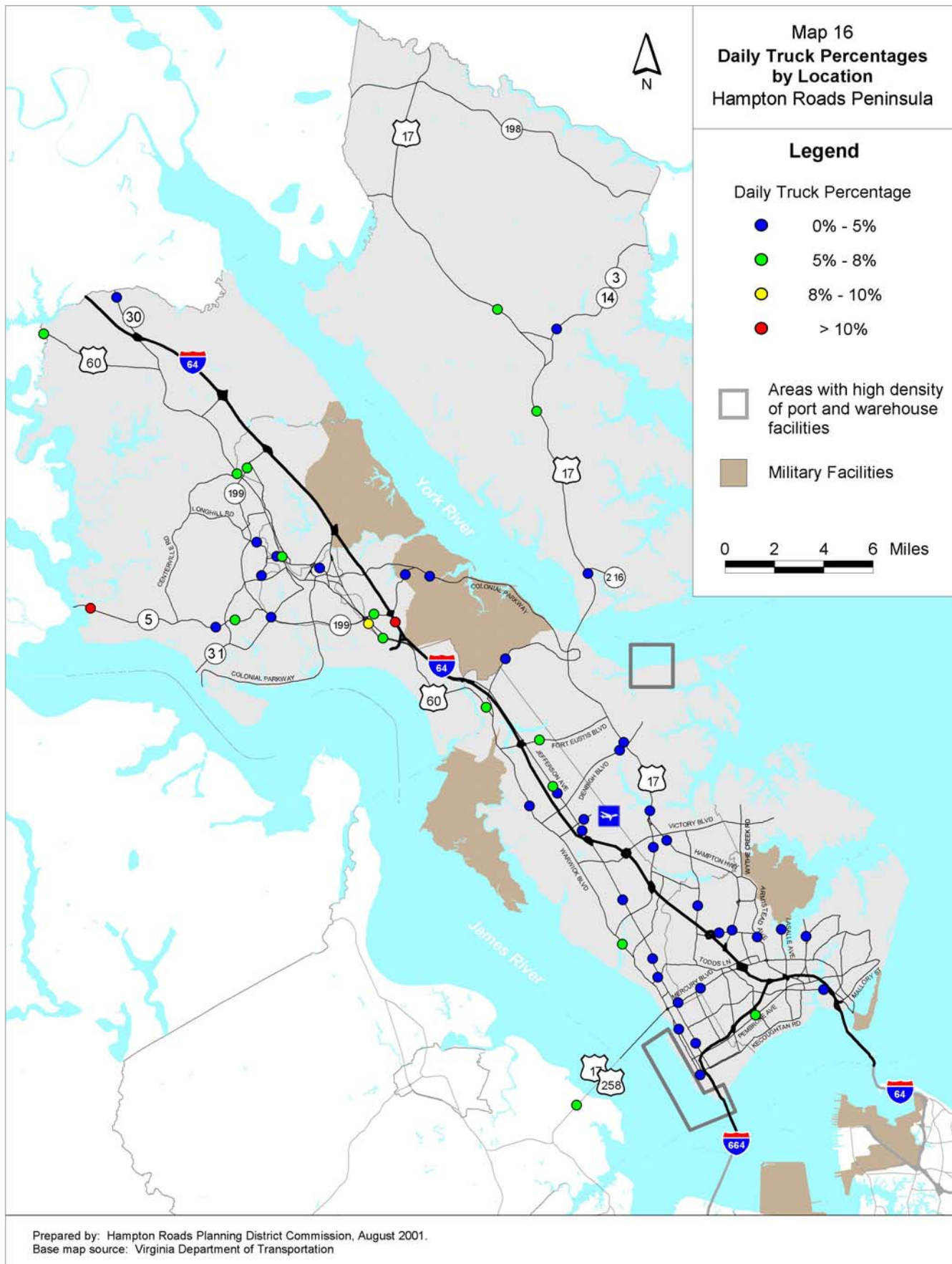
Facility	Location	Daily Volume	Daily Trucks	Daily % Trucks
US 58	Suffolk/Isle of Wight County line and Route 189	16,906	4,277	25.3%
Route 460	Winston Drive and Cut Thru Road	13,972	2,791	20.0%
Route 13	Chesapeake Bay Bridge-Tunnel	7,049	1,391	19.7%
Norview Avenue	Azalea Garden Road and Norfolk International Airport	14,619	2,782	19.0%
Whaleyville Blvd	North Carolina State Line and Route 616	5,037	954	18.9%
Carolina Road (Route 13)	Whaleyville Boulevard and Turlington Road	5,898	875	14.8%
Route 460	Suffolk/Isle of Wight County line and Ennis Mill Road	18,350	2,480	13.5%
Dominion Boulevard (Route 17/104)	Number 10 Lane and West Road	6,930	906	13.1%
Battlefield Boulevard (Route 168)	Va/NC State Line and Ballahack Road	17,319	2,209	12.8%
Routes 13/58/460	ECL Suffolk and I-664	57,010	6,723	11.8%
Pacific Avenue	17th Street and 18th Street	16,751	1,897	11.3%
John Tyler Memorial Highway (Rte 5)	Charles City Limits and Brick Bat Road (Route 613)	3,533	392	11.1%
Nanesmond Parkway	Sleepy Hole Road and Nanesmond Parkway Elem. School	10,821	1,190	11.0%
I-664	Bridge Road and College Drive	47,321	4,922	10.4%
I-64	Route 199 and Merrimac Trail	56,071	5,654	10.1%

Source: Virginia Department of Transportation.

⁶ Truck data for the Chesapeake Bay Bridge-Tunnel includes only daily truck volumes and percentages. All hourly data analysis in this report does not include the Chesapeake Bay Bridge-Tunnel, but includes the other 146 locations.



Prepared by: Hampton Roads Planning District Commission, August 2001.
Base map source: Virginia Department of Transportation



Not surprisingly, analyzing high levels of truck traffic by daily percentages skews toward rural areas and gateways of the region. Of the 15 locations with a daily truck percentage of greater than 10%, only the two interstate locations had a daily total volume higher than the 147-count average. All but two of the 15 locations were located on the Southside, and none of these locations were in the more urbanized areas inside the Hampton Roads beltway. While higher truck percentages in rural areas are a concern for various reasons, particularly related to safety, they do not contribute to localized congestion as they would in the urban areas of the region.



PICTURE 7 – Truck traffic on Hampton Boulevard near Norfolk International Terminal.

Daily Truck Volumes

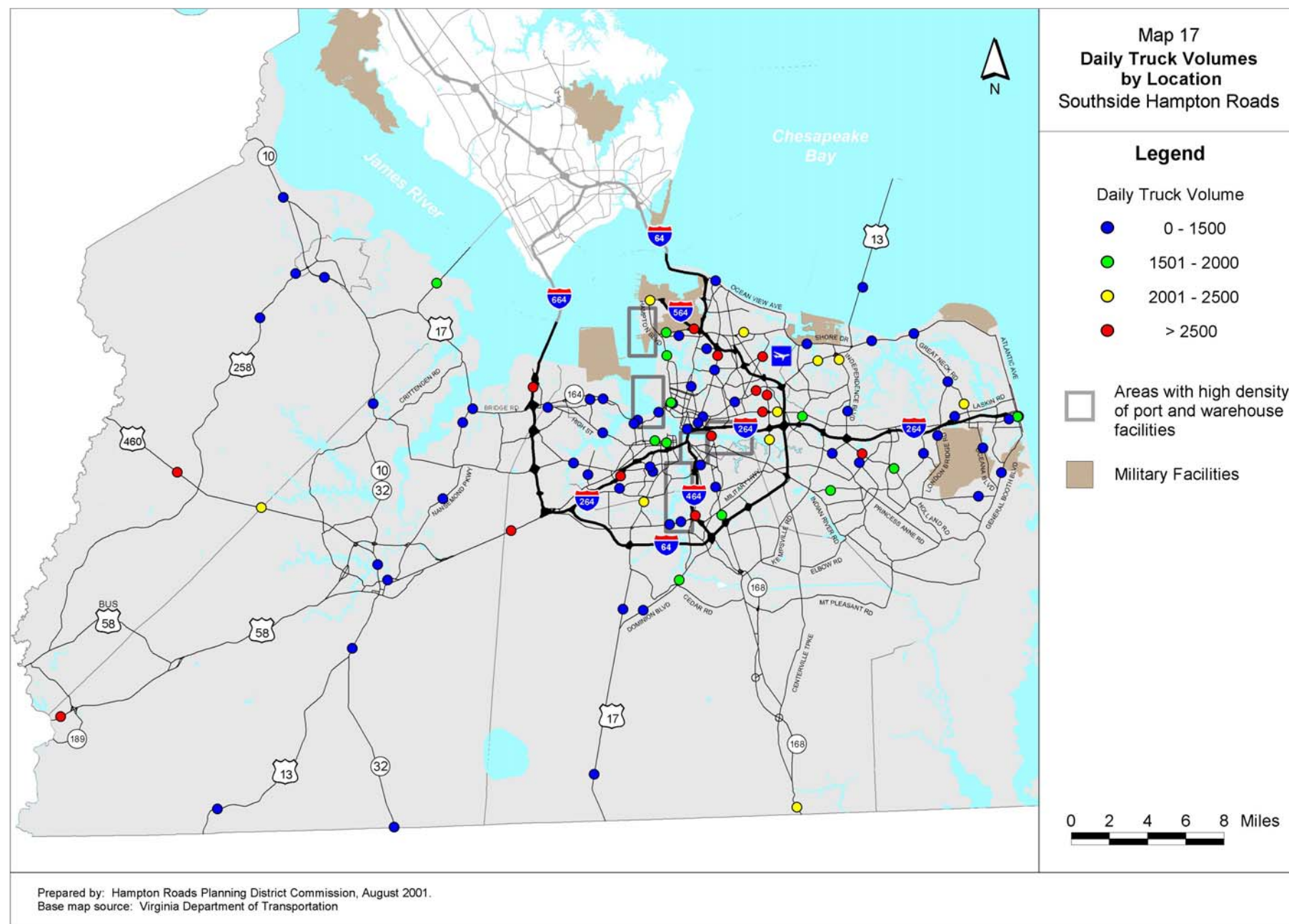
While using daily truck percentages to analyze high truck locations disproportionately favors rural areas, analyzing daily truck volumes gives a better representation of high truck locations in the urban areas. **Maps 17 and 18** on pages 44 and 45 show the daily truck volumes found at each count location. **Table 14** includes the locations with a high daily volume (greater than 2,500) of truck traffic.

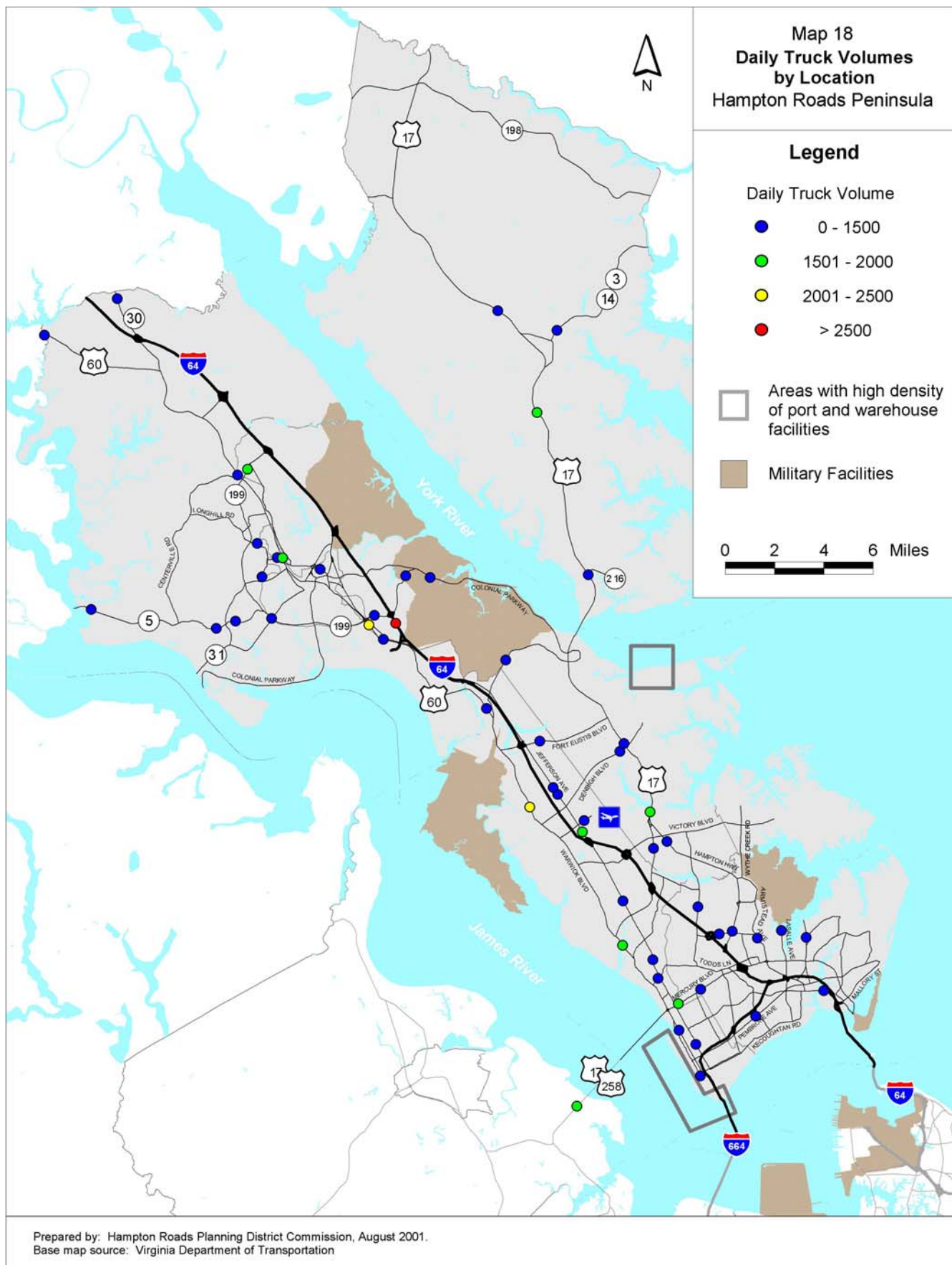
TABLE 14 – Locations with a High Daily Truck Volume

Facility	Location	Daily Total Volume	Daily Truck Volume	Daily Truck Percentage
Routes 13/58/460	ECL Suffolk and I-664	57,010	6,723	11.8%
I-64	Route 199 and Merrimac Trail	56,071	5,654	10.1%
I-664	Bridge Road and College Drive	47,321	4,922	10.4%
US 58	Suffolk/Isle of Wight County line and Route 189	16,906	4,277	25.3%
I-264	Victory Blvd and Portsmouth Blvd	53,683	3,752	7.0%
Holland Road	South Plaza Trail and Independence Boulevard	43,238	3,205	7.4%
I-464	Military Highway and Freeman Avenue	47,653	3,134	6.6%
I-564	I-64 and International Terminal Blvd	73,643	3,112	4.2%
Tidewater Drive	Philpotts Road and Widgeon Road	36,864	3,019	8.2%
Military Highway	Lowery Avenue and Lewis Road	48,860	2,848	5.8%
Route 460	Winston Drive and Cut Thru Road	13,972	2,791	20.0%
Norview Avenue	Azalea Garden Road and Norfolk International Airport	14,619	2,782	19.0%
Princess Anne Road	River Oaks Drive and Darden Street	26,948	2,651	9.8%
Campostella Road	Campostella Bridge	34,831	2,581	7.4%
Virginia Beach Boulevard	Round Bay Road and Briar Hill Road	33,841	2,519	7.4%

Source: Virginia Department of Transportation.

Of the 15 locations with a daily volume of greater than 2,500 trucks, 8 are inside the Hampton Roads beltway, and 12 locations had volumes that are above the 147-count average. Six of the locations with high daily truck volumes also had daily truck percentages greater than 10%. Locations with both high truck volumes and percentages are examined in detail later in this report.





Peak Hour Truck Volumes

Although congestion can occur at almost any time of the day due to incidents, almost all of the recurring congestion in Hampton Roads occurs during the morning and afternoon peak periods. Transporting freight by truck during these peak hours not only further increases congestion but also burdens the trucking industry with increased time and operating costs (**Picture 8**). As is detailed in the Regional Truck Data Summary section later in this report, the number of trucks using regional roadways is consistent throughout most of the day, although the number of trucks in operation during the peak periods is significant.



PICTURE 8 – Operating trucks during congested periods leads to added time and operational costs.

Morning Peak Hour

Maps 19 and 20 on pages 48 and 49 show the truck volumes found at each classification count location during the morning peak hour. The weighted average morning peak hour truck volume for all 146 locations is 90.9 trucks, or 5.3% of all morning peak hour traffic. This is slightly above the average daily truck percentage of 5.2%.

The middle 80% of the classification count locations had between 22 and 173 trucks during the morning peak hour. Locations with a morning peak hour volume of greater than 200 trucks were considered to have a high level of truck traffic. **Table 15** includes these eleven locations with high truck volumes during the morning peak hour. The majority of these locations are in urban areas, although a few rural locations are also represented in the table.

TABLE 15 – Locations with High Truck Volumes During the Morning Peak Hour

Facility	Location	AM Peak Hour Truck Volume	AM Peak Hour Truck Percentage
Routes 13/58/460	ECL Suffolk and I-664	375	8.4%
I-64	Route 199 and Merrimac Trail	369	8.0%
I-664	Bridge Road and College Drive	317	7.8%
US 58	Suffolk/Isle of Wight County line and Route 189	265	31.0%
I-464	Military Highway and Freeman Avenue	245	5.1%
Campostella Road	Campostella Bridge	244	9.6%
Holland Road	South Plaza Trail and Independence Boulevard	239	9.2%
Tidewater Drive	Philpotts Road and Widgeon Road	223	8.9%
Independence Boulevard	South Plaza Trail and Green Meadows Drive	216	11.8%
Virginia Beach Boulevard	Round Bay Road and Briar Hill Road	213	9.2%
Princess Anne Road	River Oaks Drive and Darden Street	207	11.3%

Source: Virginia Department of Transportation.

Afternoon Peak Hour

Maps 21 and 22 on pages 50 and 51 show the truck volumes found at each classification count location during the afternoon peak hour. The average afternoon peak hour truck volume for all 146 locations is 88.6 trucks, or 4.2% of all afternoon peak hour traffic. These numbers are both below the number and percentage of trucks found during the morning peak hour, and the average daily truck percentage.

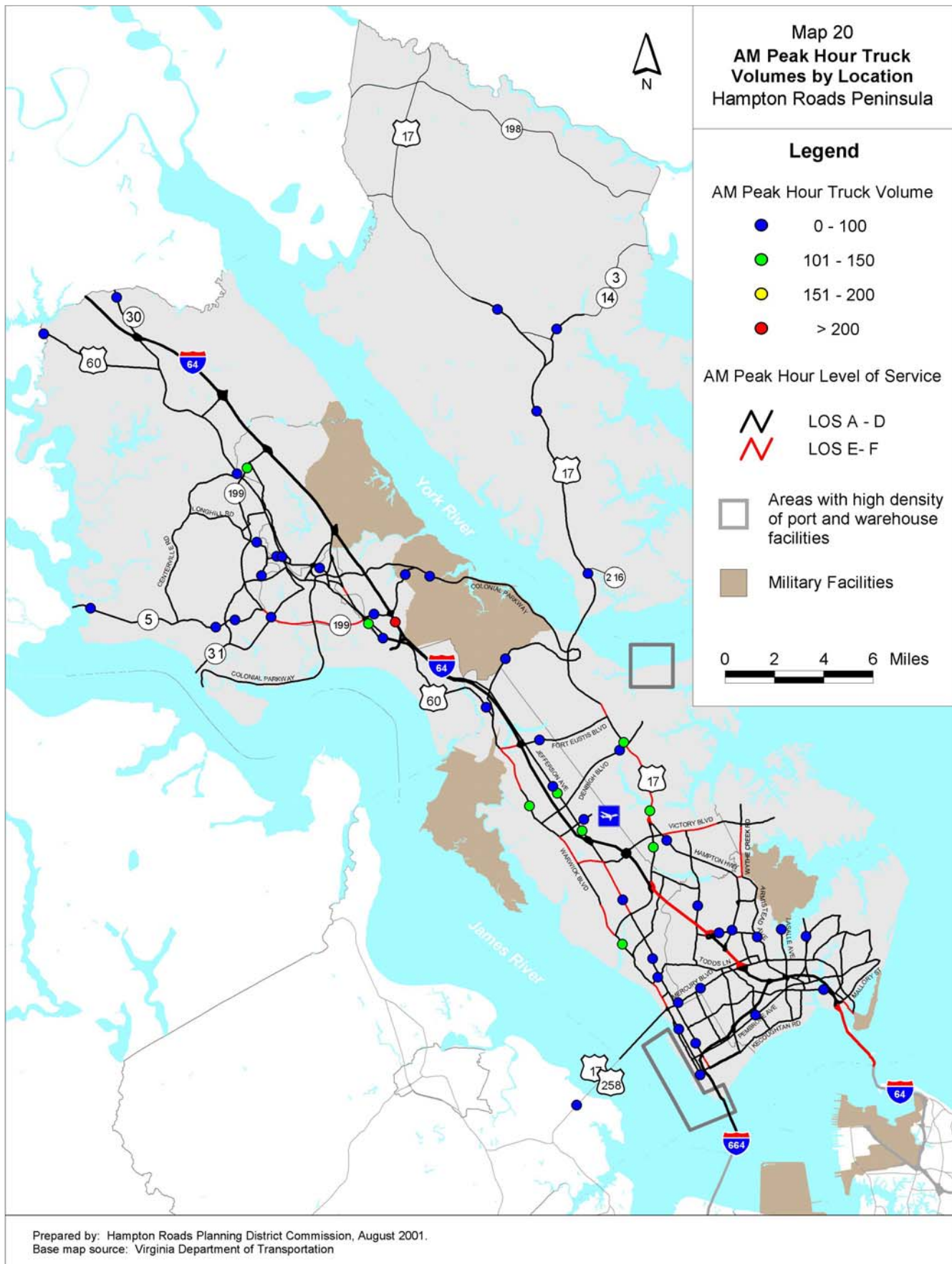
The middle 80% of the classification count locations experienced between 20 and 170 trucks during the afternoon peak hour. Locations with an afternoon peak hour volume of greater than 200 trucks were considered to have a high level of truck traffic. **Table 16** includes the twelve locations with high truck volumes during the afternoon peak hour.

TABLE 16 – Locations with High Truck Volumes During the Afternoon Peak Hour

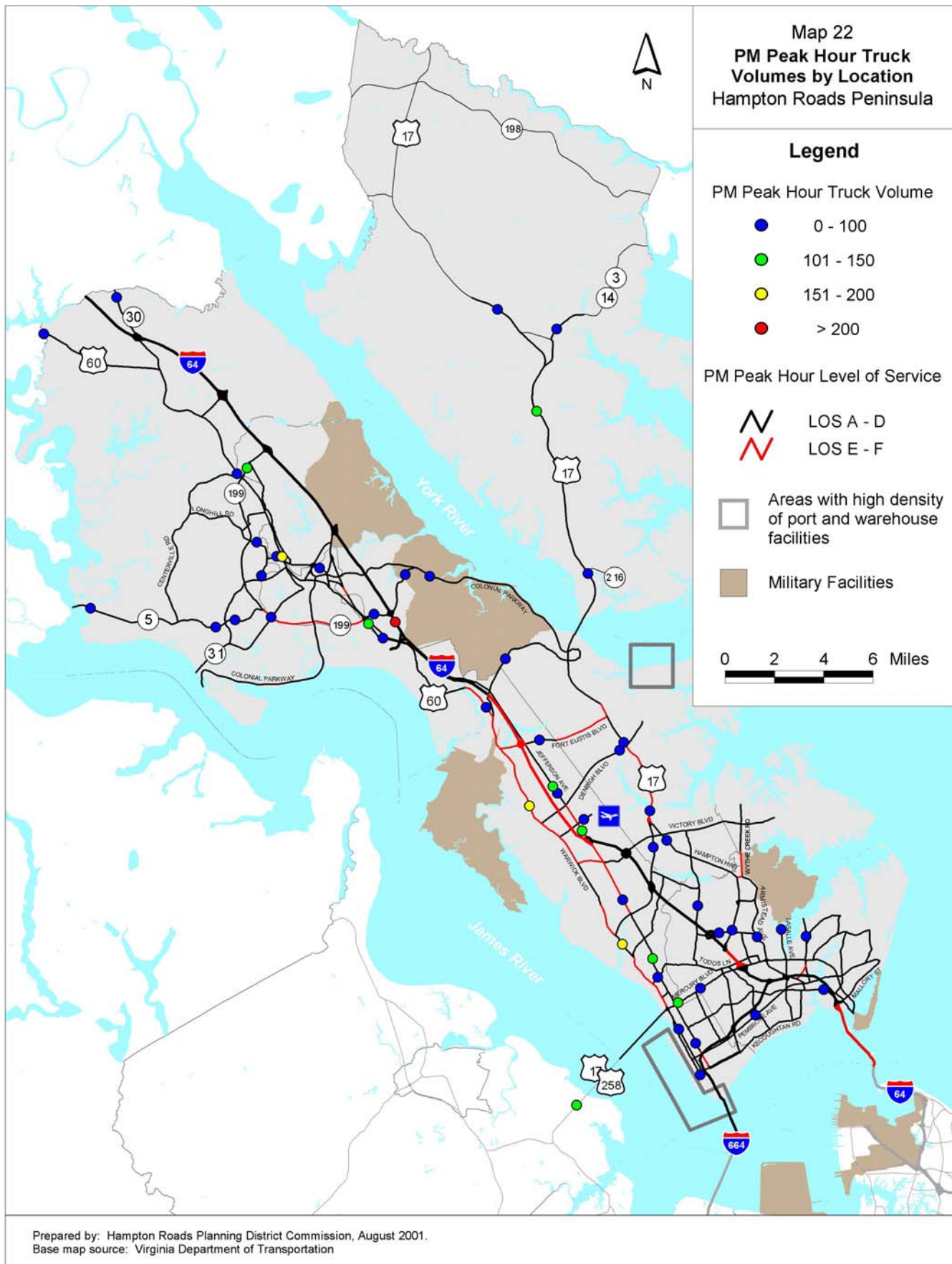
Facility	Location	PM Peak Hour Truck Volume	PM Peak Hour Truck Percentage
I-664	Bridge Road and College Drive	369	7.9%
Routes 13/58/460	ECL Suffolk and I-664	366	7.8%
I-564	I-64 and International Terminal Blvd	314	5.3%
US 58	Suffolk/Isle of Wight County line and Route 189	273	19.6%
Military Highway	Virginia Beach City Line and Broughton Street	259	5.5%
I-64	Route 199 and Merrimac Trail	234	5.4%
Norview Avenue	Azalea Garden Road and Norfolk International Airport	228	18.9%
Tidewater Drive	Philpotts Road and Widgeon Road	227	8.7%
I-264	Victory Blvd and Portsmouth Blvd	203	4.4%
Military Highway	Lowery Avenue and Lewis Road	201	5.4%
Holland Road	South Plaza Trail and Independence Boulevard	200	6.6%
Princess Anne Road	River Oaks Drive and Darden Street	200	10.2%

Source: Virginia Department of Transportation.







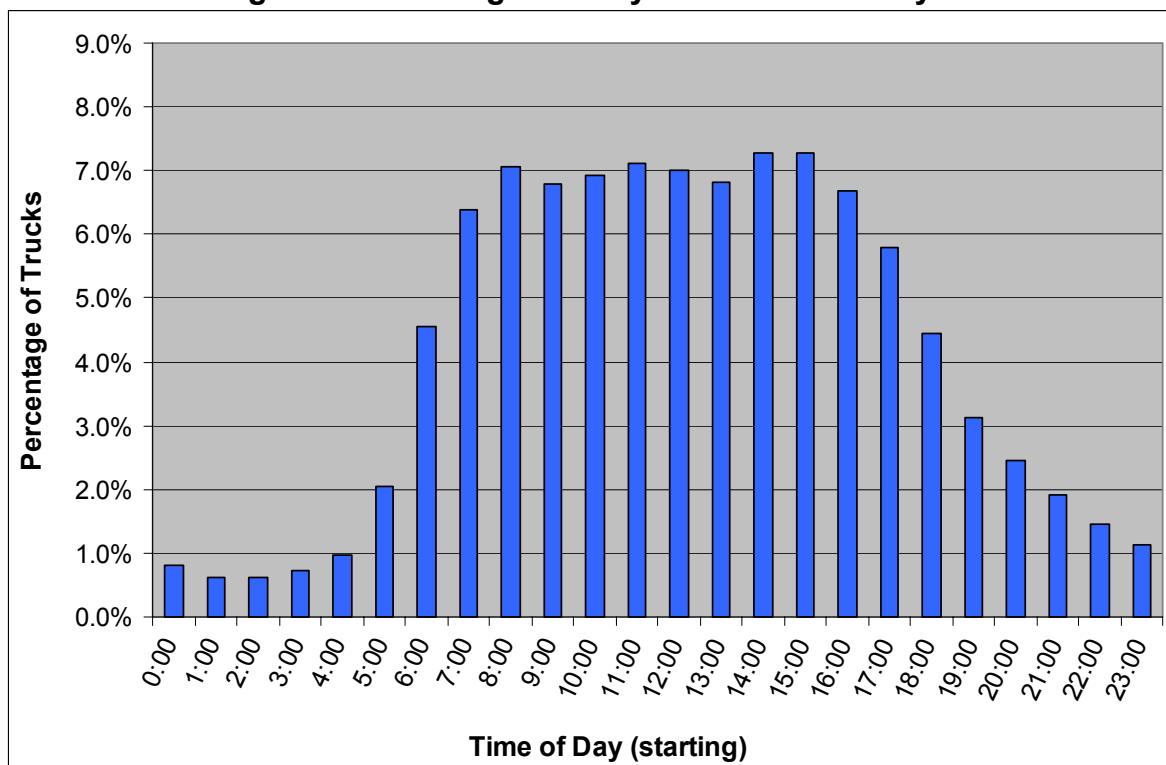


Regional Truck Data Summary

This section examines hourly trends of truck traffic at 146 regional classification count locations, and compares these trends to general traffic trends.

Figure 18 shows the hourly truck volumes as a percentage of the total daily truck volumes at 146 regional classification count locations. While traffic counts for all vehicles have peaks in the morning and afternoon, truck traffic does not have a particular peak hour. Instead, truck traffic is consistent throughout the day with hourly truck volumes as a percentage of daily truck volumes remaining between 6.7% and 7.3% for every hour between 8:00 am and 5:00 pm. This plateau in the truck volumes, while not occurring in the heaviest of traffic conditions, does encompass portions of the morning and afternoon peak traffic periods and has an adverse affect on already congested roadways.

FIGURE 18 – Regional Percentage of Daily Truck Volumes by Hour

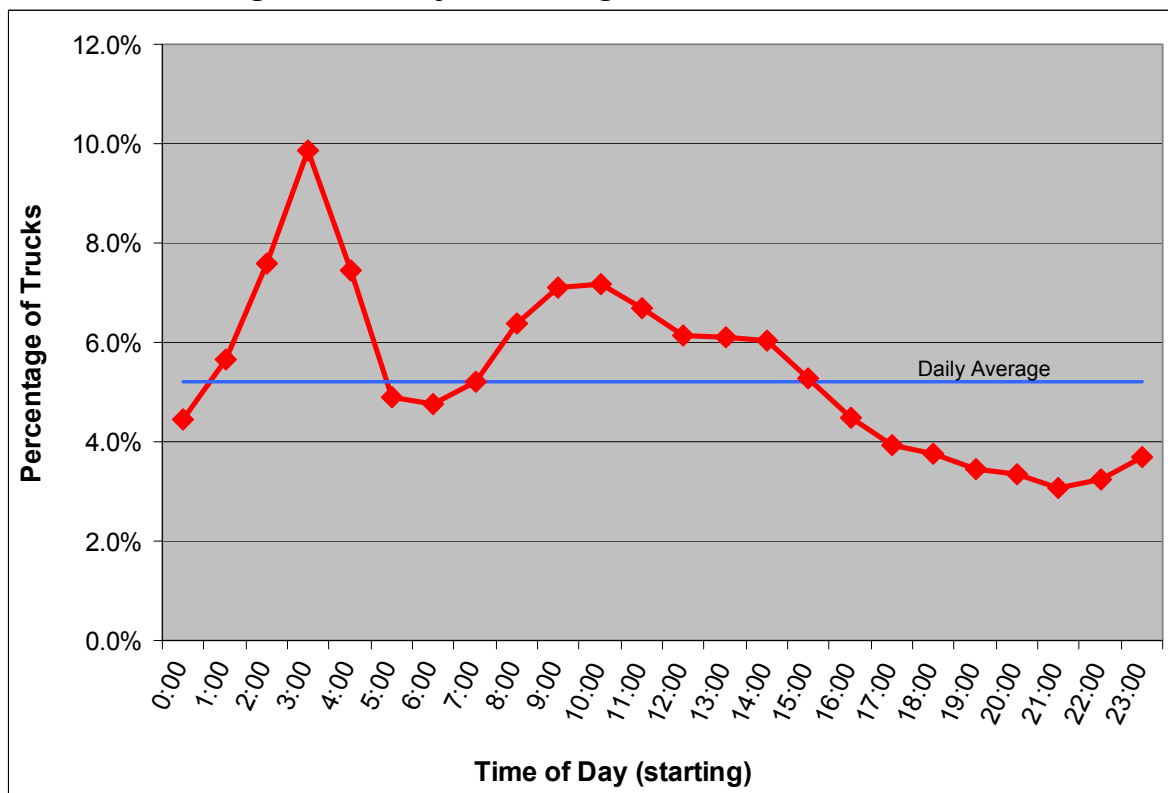


Source: Virginia Department of Transportation.

Figure 19 shows the hourly percentage of trucks relative to the total traffic volume throughout the region. The late night hours have the highest percentage of trucks on the road, with the hour beginning at 3:00 am having the highest percentage of trucks on the road at just under 10%. The lowest percentage of truck traffic each day occurs between 5:00 pm and midnight. The hours when the truck percentage is below the daily average of 5.2% is 5:00 am - 7:00 am and from 4:00 pm – 1:00 am.

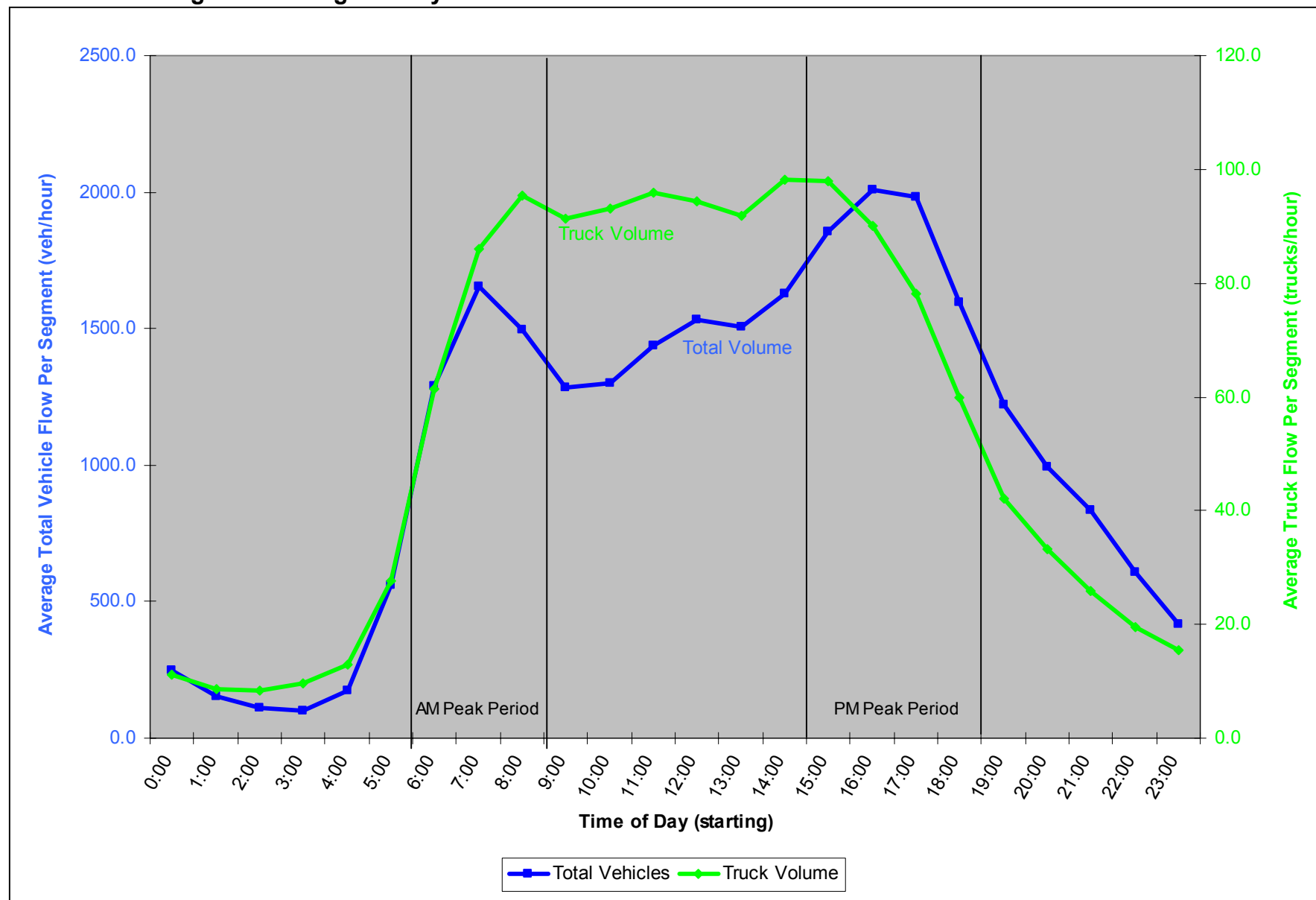
Figure 20 on page 54 shows the average vehicle flows per hour for trucks and all vehicles at all 146 regional classification count locations. This graph illustrates the peaking characteristics of total traffic, and the lack of a peak in truck traffic. Total traffic peaks for one hour in the morning and a couple hours in the afternoon. Truck traffic, however, begins to rise at 5:00 am and plateaus between 8:00 am and 4:00 pm. The graphs of truck traffic and total traffic are otherwise similar throughout the day.

FIGURE 19 – Regional Hourly Percentage of Trucks to Total Traffic Volume



Source: Virginia Department of Transportation

FIGURE 20 – Regional Average Hourly Vehicle Rates for Total Vehicles and Trucks



Source: Virginia Department of Transportation.

Specific Locations with High Trucks

The final portion of the regional truck data analysis examines specific count locations that had high levels of truck traffic. The following criteria were used to determine which locations would be analyzed in this section:

- A daily truck percentage greater than 10%
- A daily truck volume greater than 2,500
- Greater than 10% trucks in the morning peak hour
- Greater than 200 trucks in the morning peak hour
- Greater than 10% trucks in the afternoon peak hour
- Greater than 200 trucks in the afternoon peak hour

It was also noted if a particular location was within 80% of these values.

All of the locations meeting at least one of these criteria are listed in **Appendix D**. Of the 146 regional locations, 28 fully meet at least one criterion, and 44 locations meet at least 80% of one of the measures listed above. Only one location, Route 58 between the Suffolk/Isle of Wight County Line and Route 189, fully met all six criteria. The following eight locations meet at least 80% of five of the six criteria listed above:

- US 58 between Suffolk/IW Line and Route 189
- Princess Anne Rd between River Oaks Dr and Darden St
- Norview Avenue between Azalea Garden Rd and NIA
- Route 460 between Winston Dr and Cut Thru Rd
- Tidewater Dr between Philpotts Rd and Widgeon Rd
- I-64 between Route 199 and Merrimac Trail
- Route 13/58/460 between ECL Suffolk and I-664
- Battlefield Blvd between NC Line and Ballahack Rd

These eight locations were analyzed for each hour of the day. **Figures 21 – 28** on pages 56 – 63 detail the truck and total traffic at each location, along with a comparison of the percentage of truck traffic to total traffic for each hour of the day. The graphs are similar to Figure 19 and Figure 20 in the previous section.

Comparing these eight locations to the 146 location average shows that there are few particular trends common to all of these high truck traffic locations. Some locations, such as Tidewater Drive and Norview Avenue, contained heavy pockets of truck traffic, while other locations, such as I-64 and Route 13/58/460 had relatively high volumes of truck traffic at all hours of the day. The locations far outside the Hampton Roads beltway had graphs that closely resembled the regional average graphs although the truck percentages during the nighttime hours greatly exceeded the regional average. The graphs of the locations inside and near the Hampton Roads beltway bared little resemblance to the regional average graphs.

FIGURE 21 – Detailed Analysis of High Truck Locations

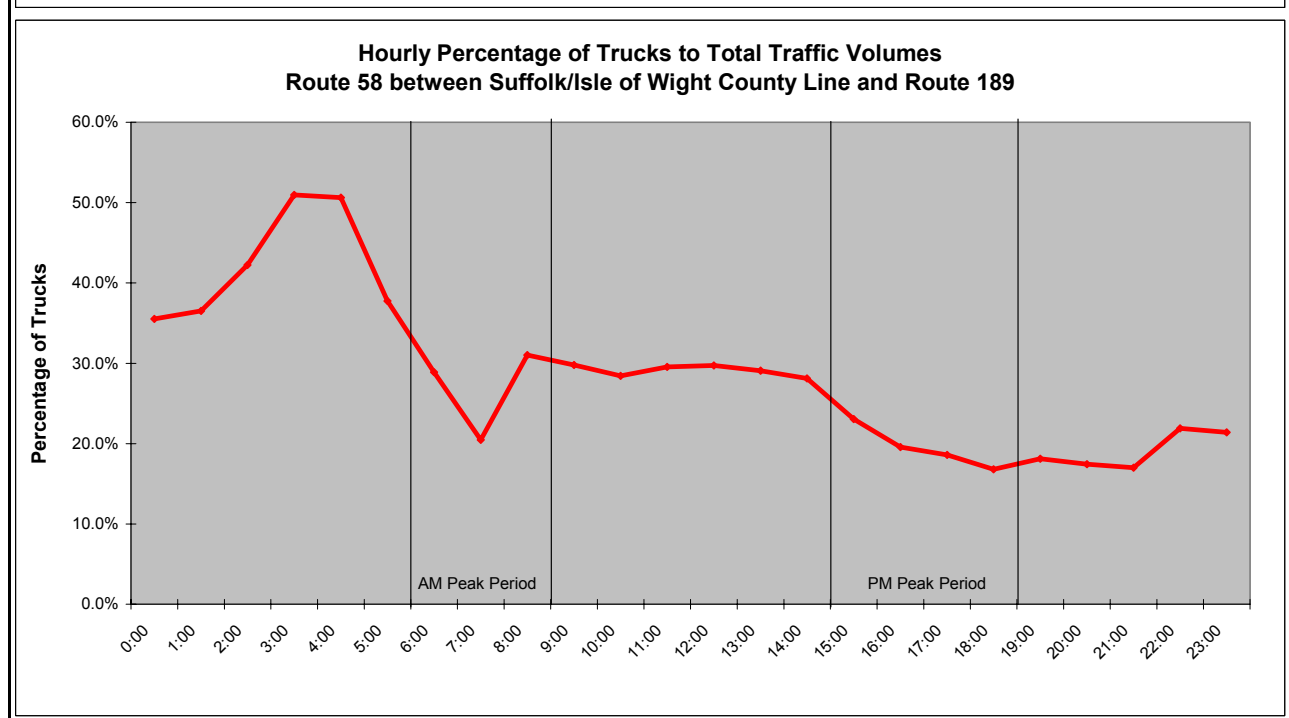
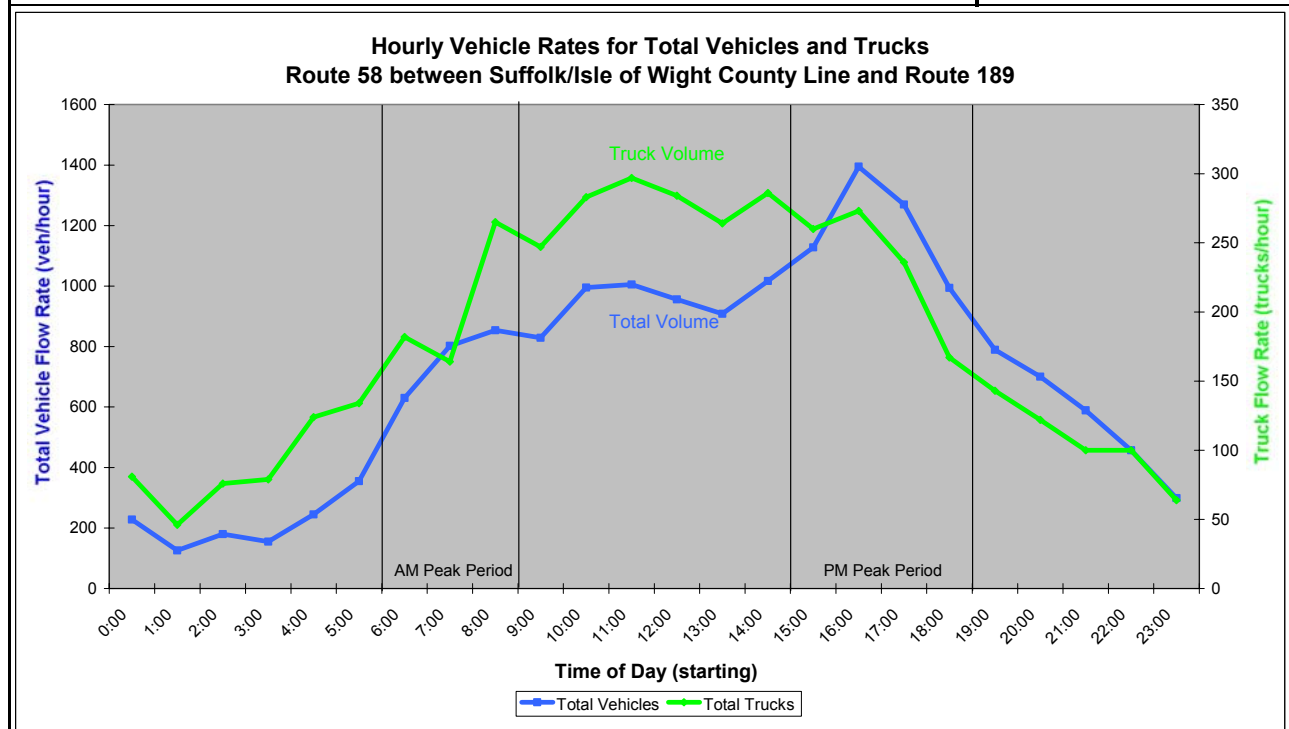
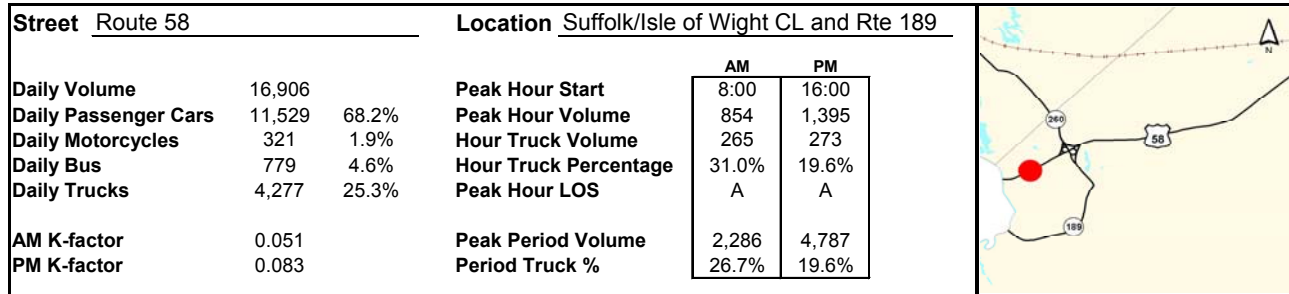
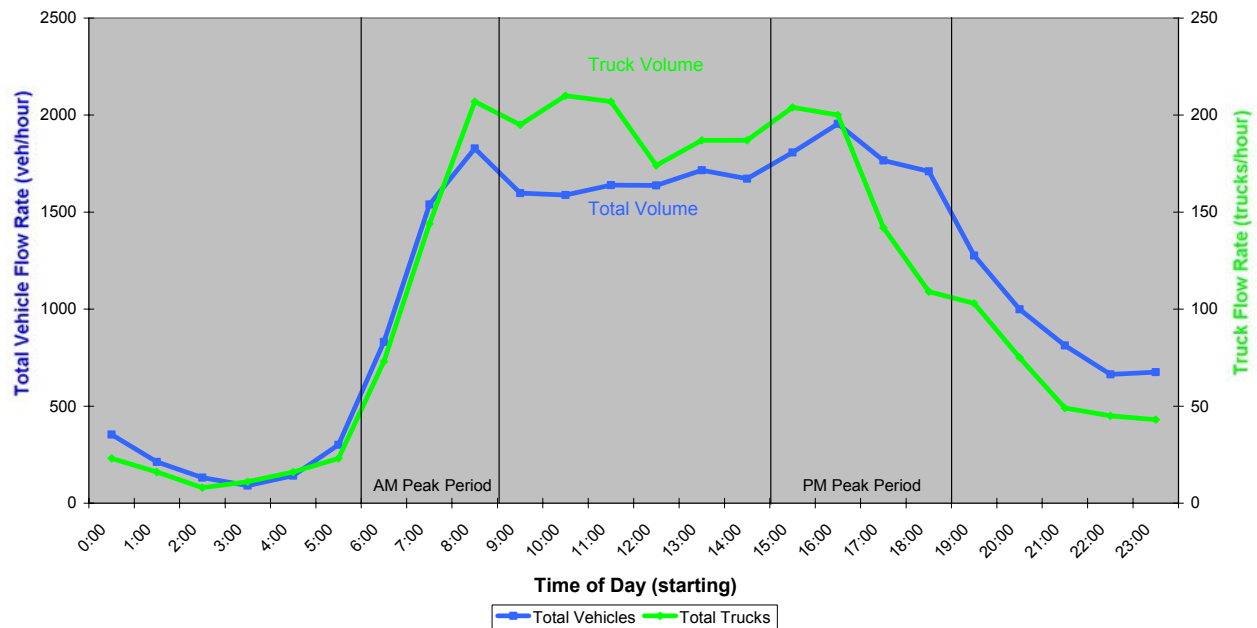


FIGURE 22 – Detailed Analysis of High Truck Locations

Street Princess Anne Road			Location River Oaks Dr and Darden St		
Daily Volume	26,948		Peak Hour Start	AM 8:00	PM 16:00
Daily Passenger Cars	24,112	89.5%	Peak Hour Volume	1,828	1,956
Daily Motorcycles	36	0.1%	Hour Truck Volume	207	200
Daily Bus	149	0.6%	Hour Truck Percentage	11.3%	10.2%
Daily Trucks	2,651	9.8%	Peak Hour LOS	C	C
AM K-factor	0.068		Peak Period Volume	4,199	7,240
PM K-factor	0.073		Period Truck %	10.1%	9.0%



Hourly Vehicle Rates for Total Vehicles and Trucks
Princess Anne Road between River Oaks Drive and Darden Street



Hourly Percentage of Trucks to Total Traffic Volumes
Princess Anne Road between River Oaks Drive and Darden Street

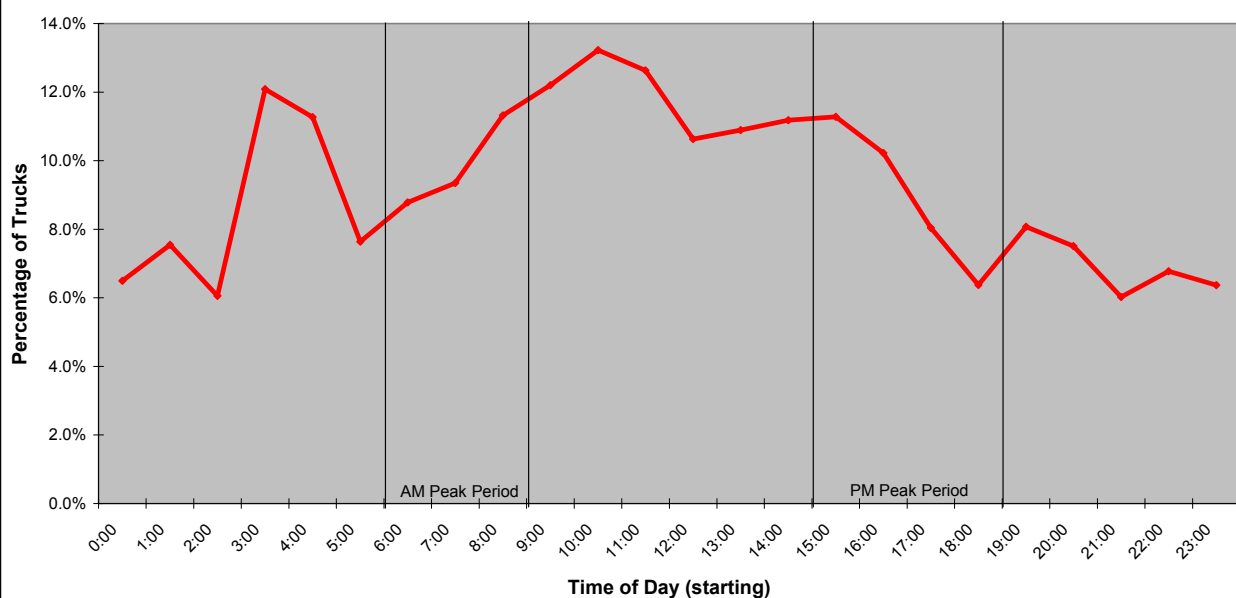


FIGURE 23 – Detailed Analysis of High Truck Locations

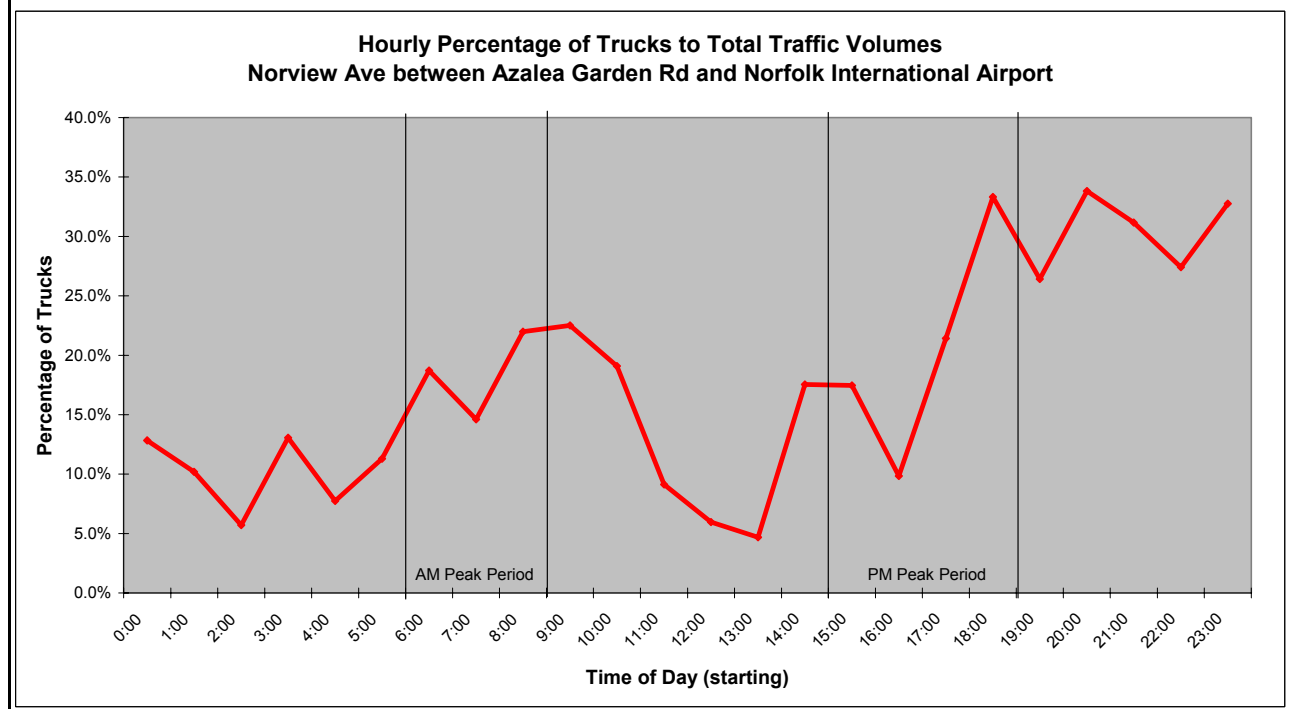
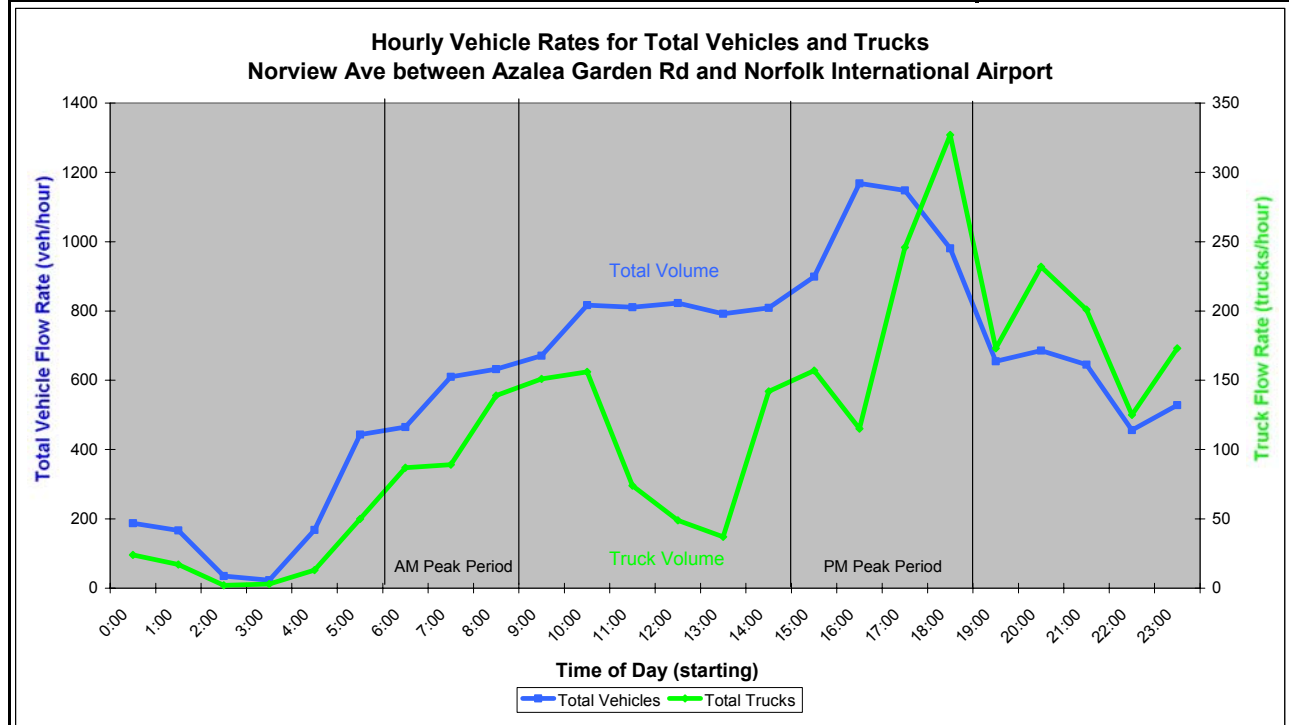
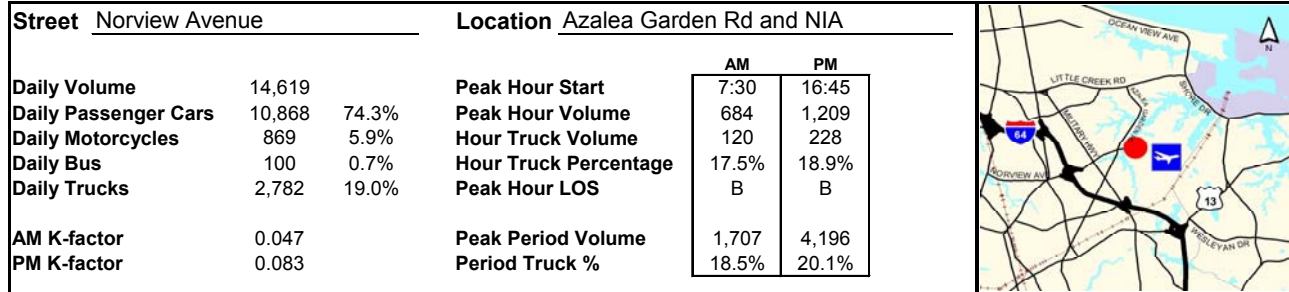


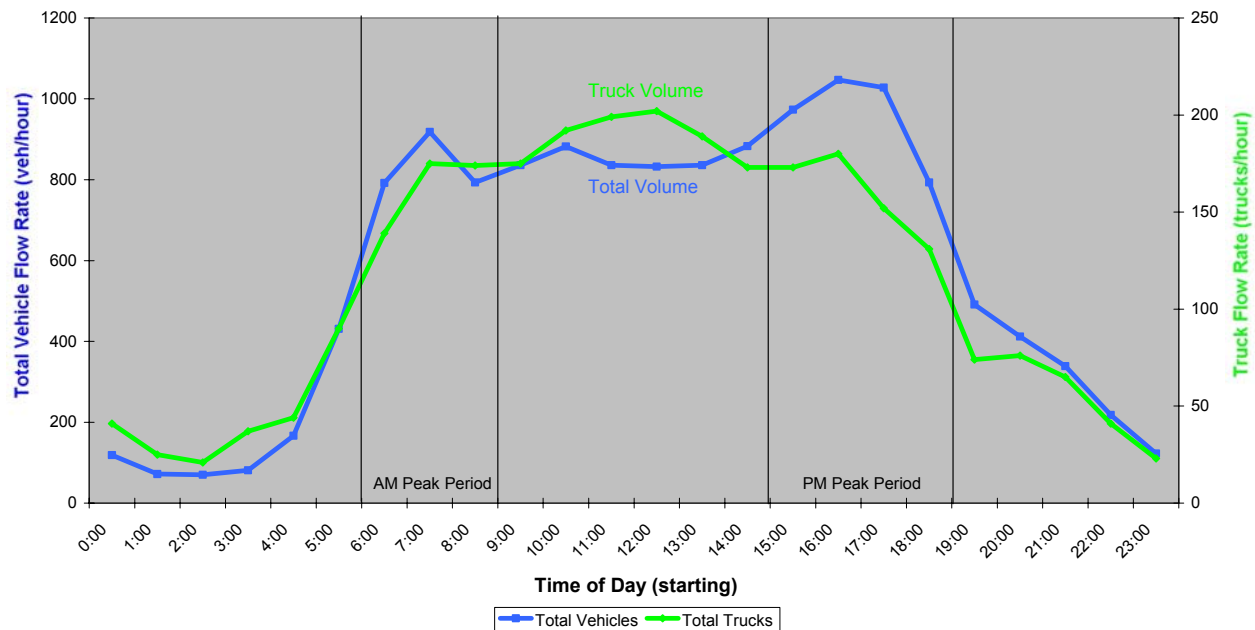
FIGURE 24 – Detailed Analysis of High Truck Locations

Street Route 460			Location Winston Dr and Cut Thru Rd		
Daily Volume 13,972			Peak Hour Start		
Daily Passenger Cars 10,929 78.2%			Peak Hour Volume		
Daily Motorcycles 22 0.2%			Hour Truck Volume		
Daily Bus 230 1.6%			Hour Truck Percentage		
Daily Trucks 2,791 20.0%			Peak Hour LOS		
AM K-factor 0.067			Peak Period Volume		
PM K-factor 0.077			Period Truck %		

	AM	PM
7:15	16:30	
936	1,079	
173	171	
18.5%	15.8%	
A	A	
2,503	3,841	
19.5%	16.6%	



Hourly Vehicle Rates for Total Vehicles and Trucks
Route 460 between Winston Drive and Cut Thru Road



Hourly Percentage of Trucks to Total Traffic Volumes
Route 460 between Winston Drive and Cut Thru Road

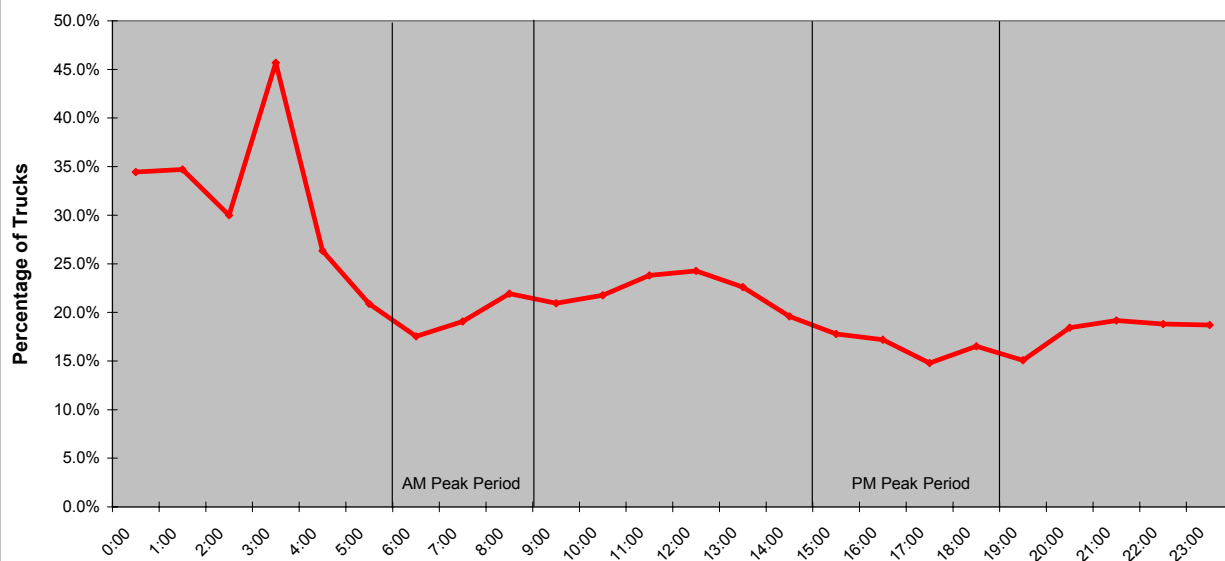


FIGURE 25 – Detailed Analysis of High Truck Locations

Street Tidewater Drive			Location Philpotts Rd and Widgeon Rd		
Daily Volume	36,864		Peak Hour Start	AM 7:30	PM 15:30
Daily Passenger Cars	33,507	90.9%	Peak Hour Volume	2,495	2,637
Daily Motorcycles	29	0.1%	Hour Truck Volume	223	203
Daily Bus	309	0.8%	Hour Truck Percentage	8.9%	7.7%
Daily Trucks	3,019	8.2%	Peak Hour LOS	D	D
AM K-factor	0.068		Peak Period Volume	6,312	9,874
PM K-factor	0.072		Period Truck %	8.5%	7.8%

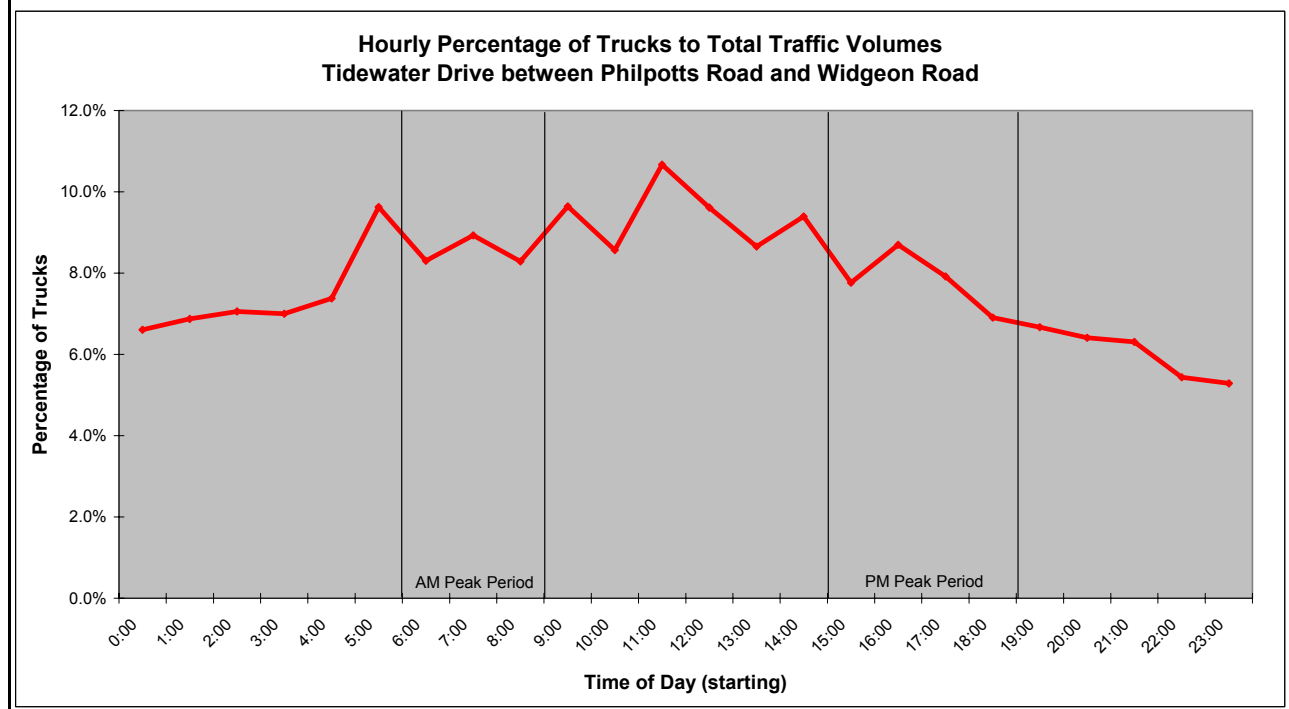
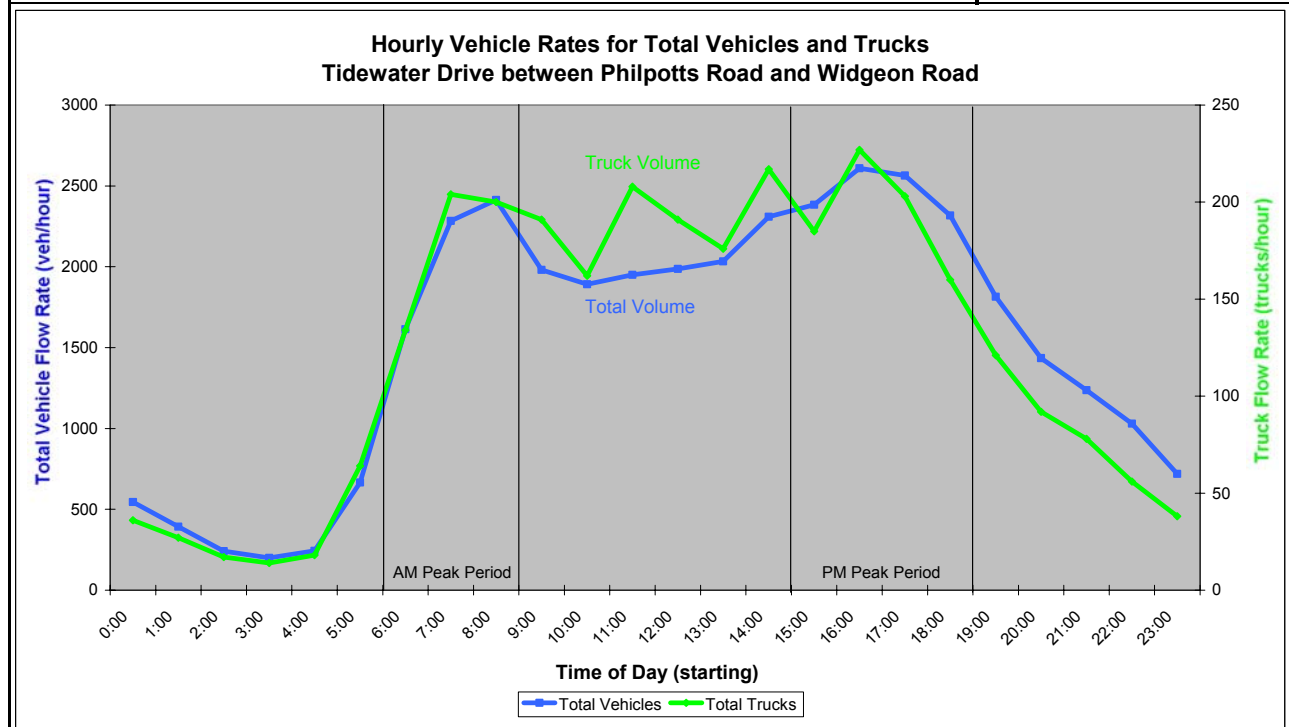


FIGURE 26 – Detailed Analysis of High Truck Locations

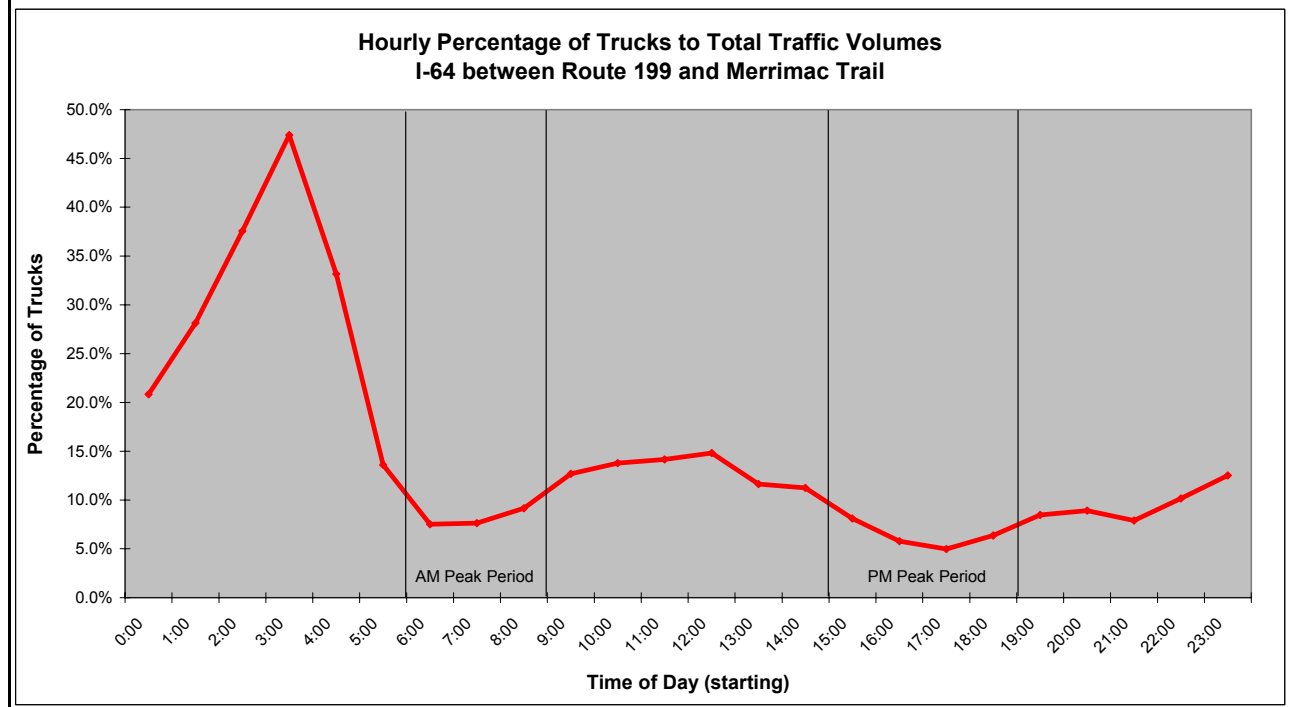
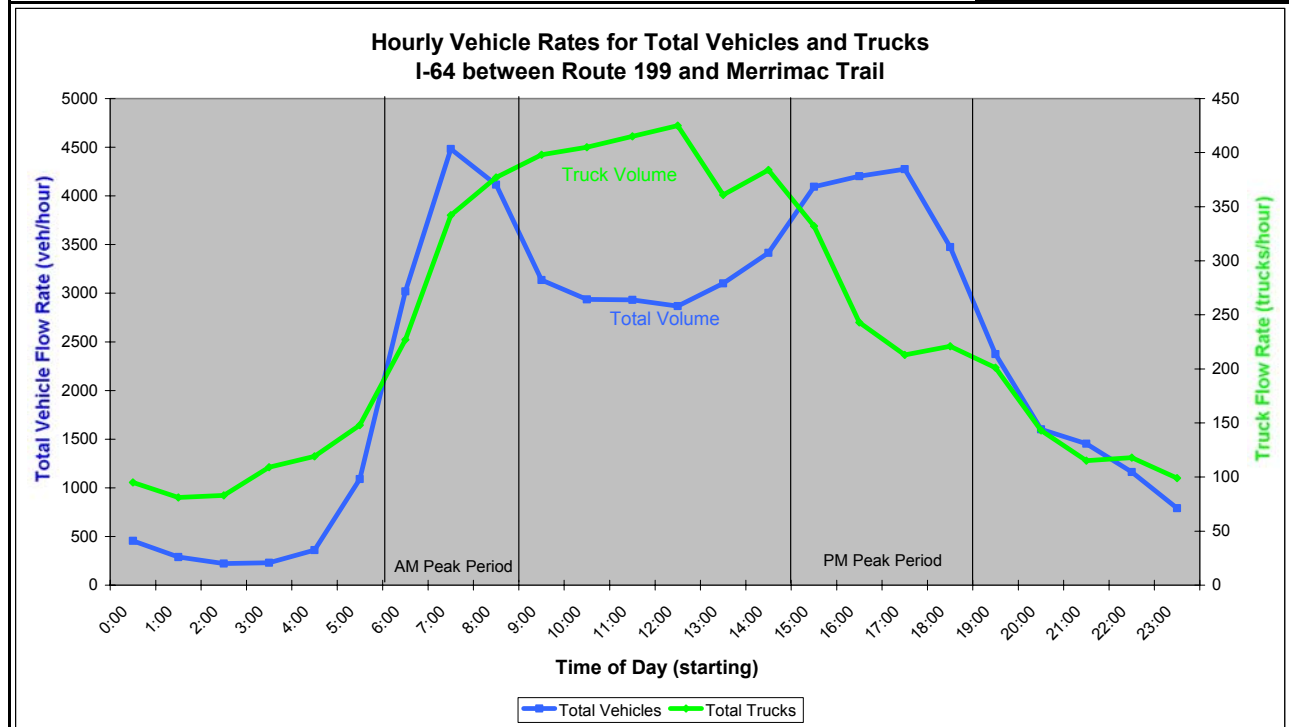
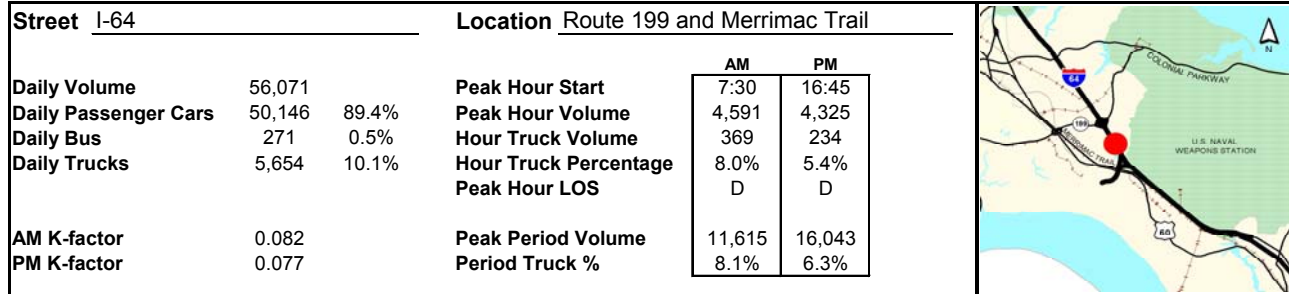


FIGURE 27 – Detailed Analysis of High Truck Locations

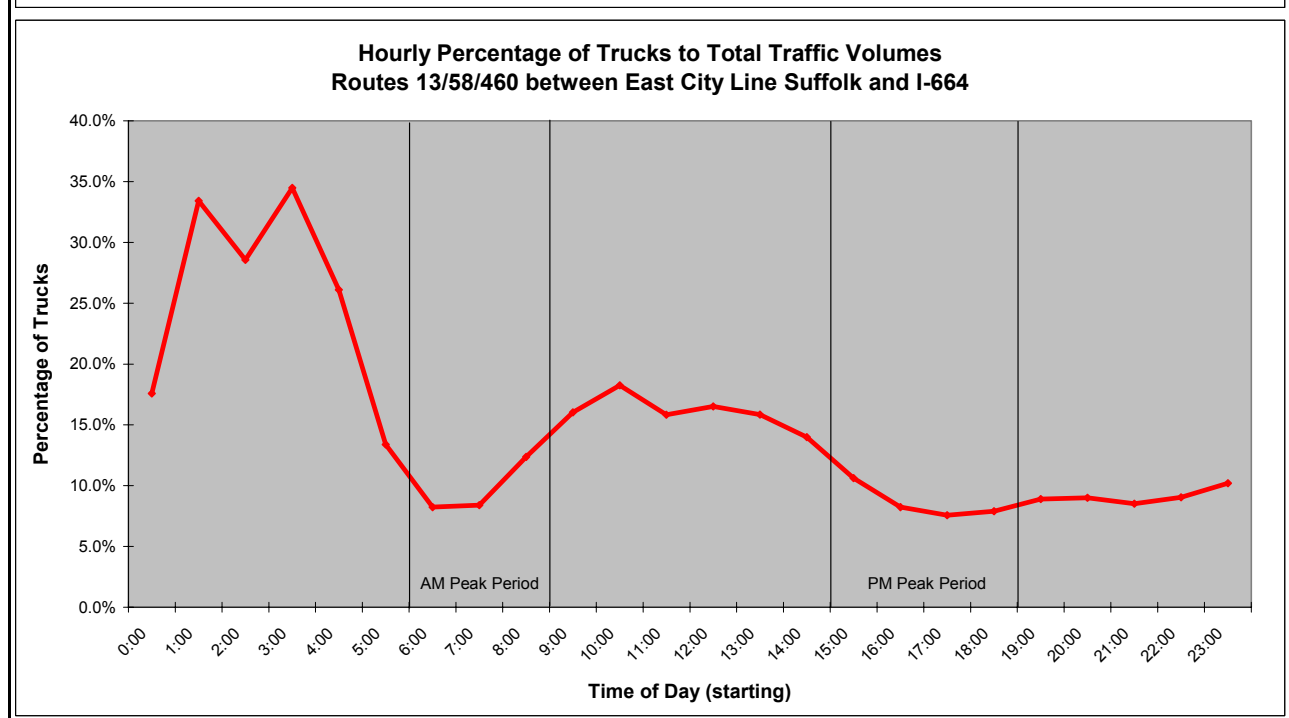
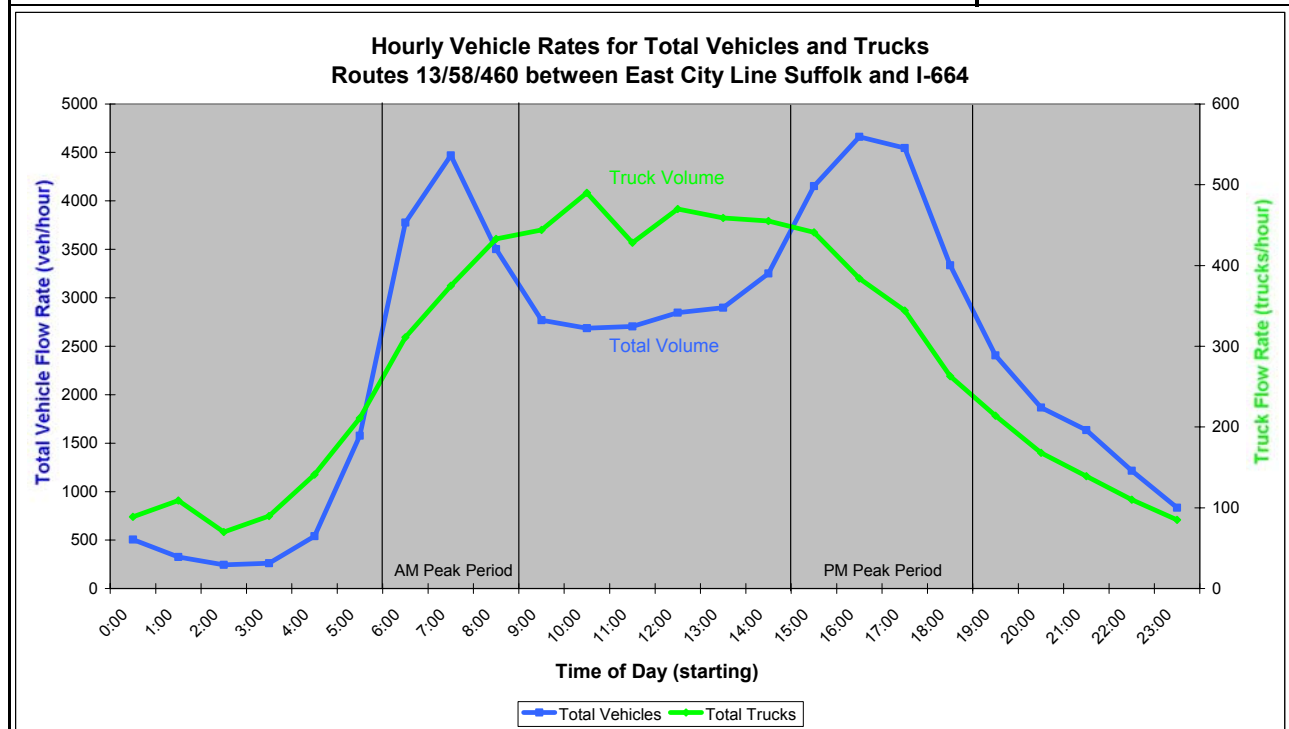
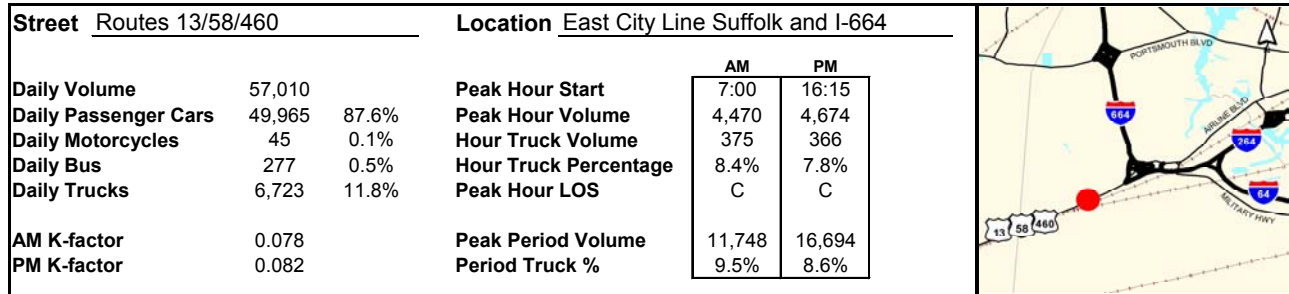
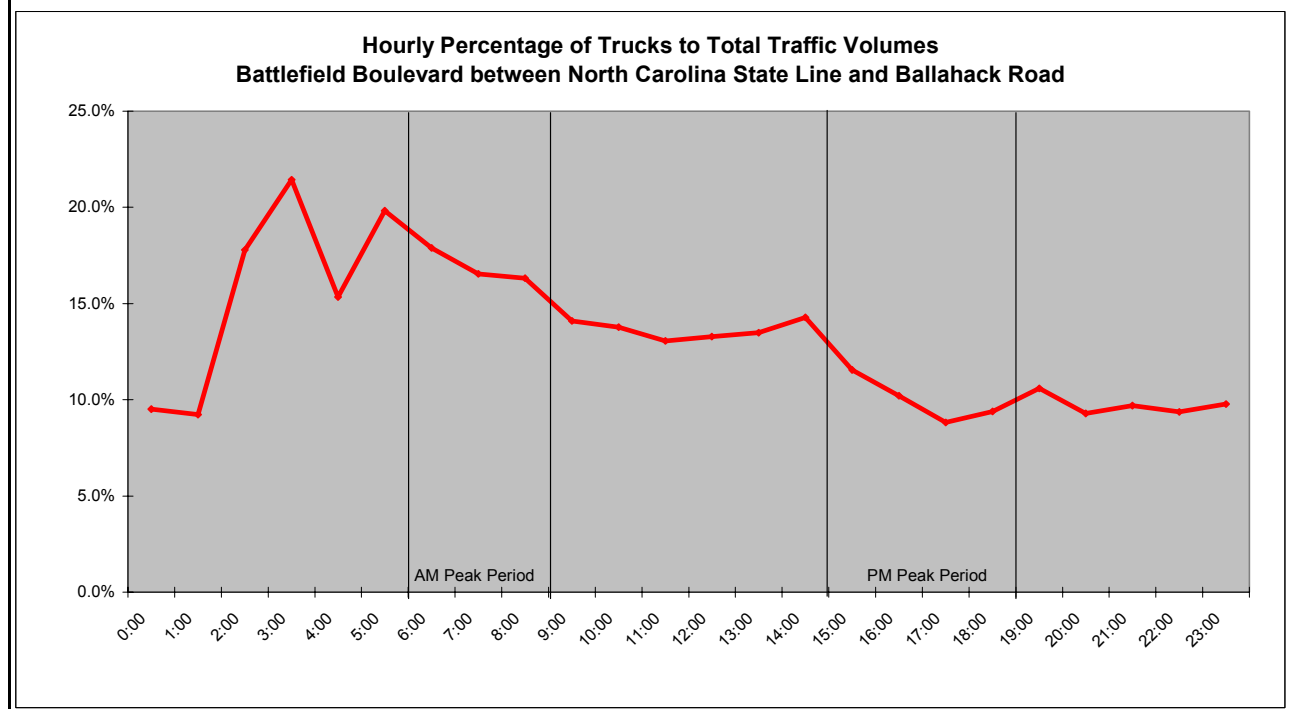
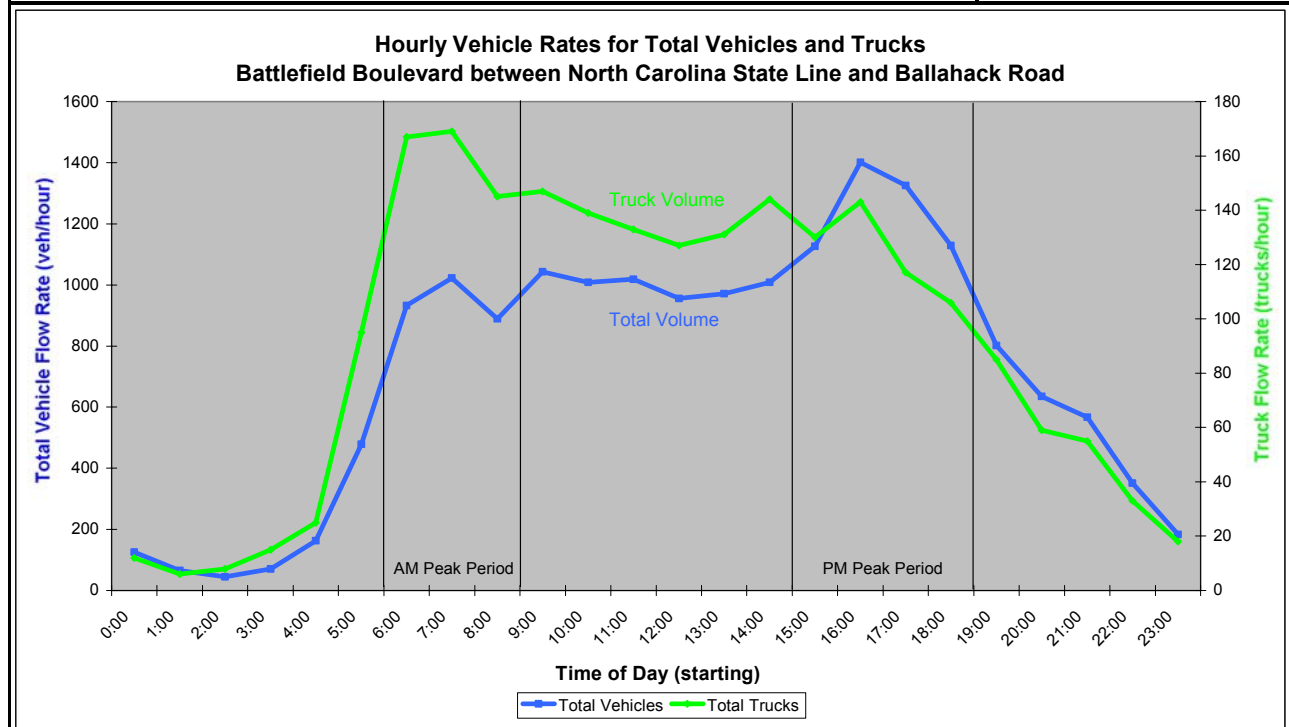


FIGURE 28 – Detailed Analysis of High Truck Locations

Street Battlefield Blvd			Location NC State Line and Ballahack Rd		
Daily Volume	17,319		Peak Hour Start	AM 6:45	PM 16:00
Daily Passenger Cars	14,705	84.9%	Peak Hour Volume	1,043	1,401
Daily Motorcycles	61	0.4%	Hour Truck Volume	173	143
Daily Bus	344	2.0%	Hour Truck Percentage	16.6%	10.2%
Daily Trucks	2,209	12.8%	Peak Hour LOS	C	C
AM K-factor	0.060		Peak Period Volume	2,844	4,981
PM K-factor	0.081		Period Truck %	16.9%	10.0%



FUTURE PORT-RELATED IMPROVEMENTS

As shown earlier in this report, the amount of general cargo using regional ports, railroads, and roadways is increasing, and significant growth is expected to continue in the future. A report done for the Virginia Port Authority in 1995 forecasted a possible 250 percent increase in container cargo by the year 2010. To help accommodate this increase in cargo, the Virginia Port Authority is in the midst of a \$400 million expansion of the Norfolk International Terminal. In addition, new port facilities are being planned for Portsmouth, including a site owned by Maersk on the Elizabeth River just north of the Western Freeway and a fourth regional Virginia Port Authority Terminal at Craney Island.

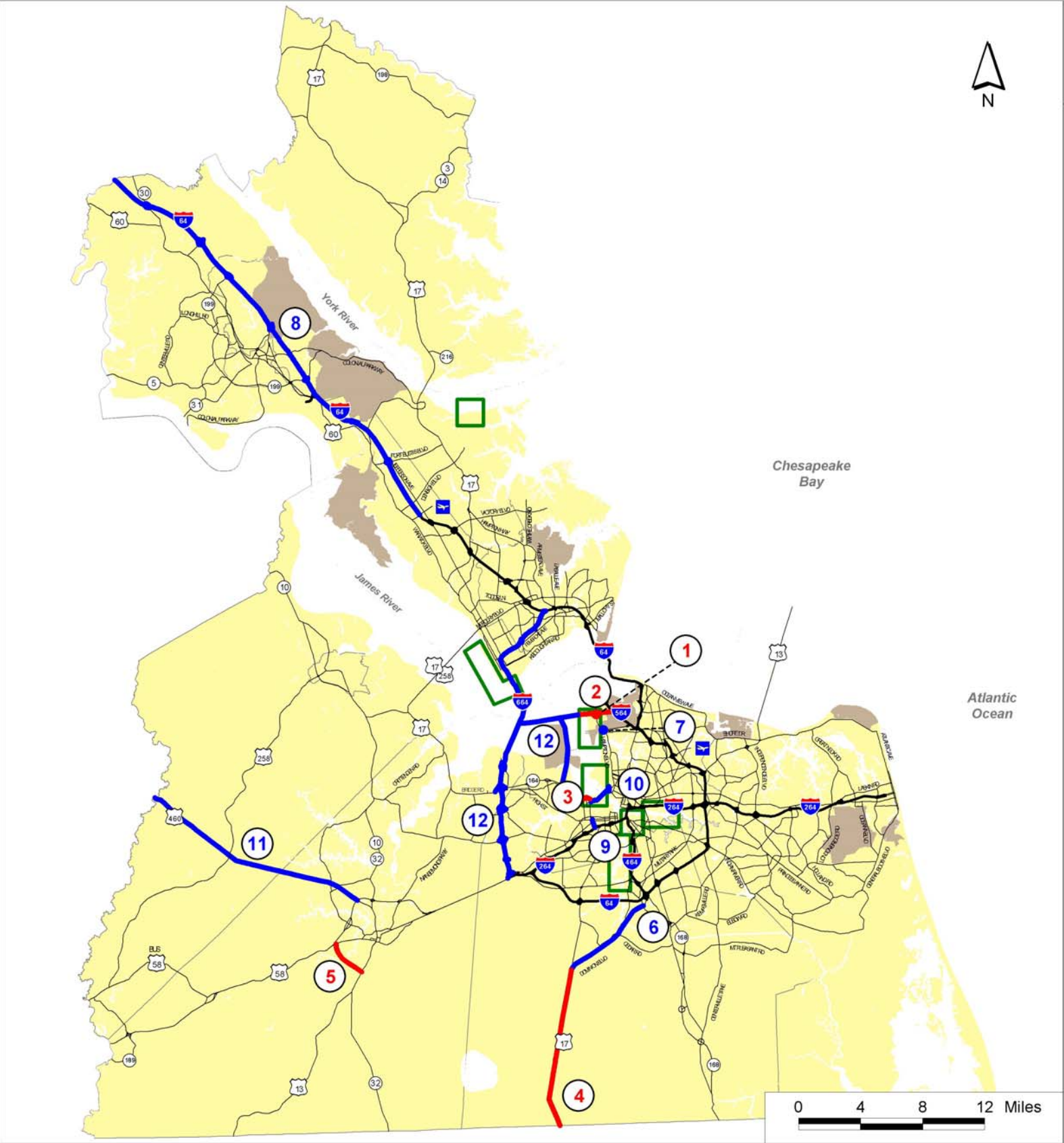
While the amount of general cargo moving through the ports is increasing, regional roadways are becoming more congested. The Hampton Roads Congestion Management System 2001 report⁷ states that 571 lane-miles of regional roadway are congested during the afternoon peak hour, with that number increasing to 681 lane-miles by 2006 and 670 lane-miles by 2021. Longer congested periods will cost shipping companies money and may alter their decisions concerning business in Hampton Roads.

With this in mind, many projects are planned that will benefit freight transportation throughout the region. **Map 23** on page 65 shows projects that are included in the Transportation Improvement Program⁸ and the Long-Range Transportation Plan⁹ that will improve freight movement and safety.

⁷ Hampton Roads Planning District Commission, "Hampton Roads Congestion Management System 2001", June 2001.

⁸ Hampton Roads Planning District Commission, "Hampton Roads Transportation Improvement Program – TIP FY 2001-2004", February 2001.

⁹ Hampton Roads Planning District Commission, "Hampton Roads 2021 Regional Transportation Plan", July 2001.



Prepared by: Hampton Roads Planning District Commission, August 2001.
Base map source: Virginia Department of Transportation

MAP 23
Planned and Programmed Roadway Improvements
Providing Direct Benefits to Regional Freight Movement

Legend

- Improvements included in the Hampton Roads TIP FY 2001-2004
- Improvements included in the Hampton Roads 2021 LRP
- Areas with high density of port and warehouse facilities
- Military Facilities

Programmed Improvements included in the Hampton Roads TIP FY 2001-2004

Map #	Facility	From/To	Description
1	Hampton Blvd	Greenbrier Ave	Remove at-grade railroad crossing and construct railroad underpass providing access to Norfolk International Terminal. (Construction Start: Fall 2002; Expected Completion: Winter 2005)
2	Intermodal Connector	I-564 to Norfolk International Terminal	New 4-lane facility providing direct freeway access to Norfolk International Terminal. Includes an overpass over Hampton Blvd. (Construction Start: Summer 2002; Expected Completion: Winter 2005)
3	Pinners Point Connector	Western Freeway to Midtown Tunnel	New 4-lane facility connecting the Western Freeway to the Midtown Tunnel and MLK Freeway. Removes trucks and other vehicles from the residential streets in Port Norfolk. (Construction Underway; Expected Completion: Winter 2006)
4	Route 17	North Carolina Line to Dominion Blvd	Widening from 2-lane to 4-lane divided facility. Provides access to similar type facility in North Carolina. (Construction Start: Fall 2002; Expected Completion : Summer 2005)
5	Southwest Suffolk Bypass	Carolina Rd (Rte 13) to Suffolk Bypass (Rte 58)	New 4-lane limited access facility connecting Routes 13 and 58. Removes trucks and other vehicles from downtown Suffolk and neighboring roadways. (Construction Underway; Expected Completion: Fall 2003)

Planned Improvements included in the Hampton Roads 2021 Long-Range Plan

Map #	Facility	From/To	Description
6	Dominion Blvd	Route 17 to Chesapeake Expressway	Widen to 4-lane partially limited access divided facility. Includes a new high-rise bridge over the Albermarle and Chesapeake canal.
7	Hampton Blvd	International Terminal Blvd	New interchange at Hampton Blvd and International Terminal Blvd. Includes a railroad grade separation for Hampton Blvd.
8	I-64	Bland Blvd to New Kent County Line	Widening to 6-lane facility from Bland Blvd to I-295 near Richmond. Reduces congestion on only interstate entry into Hampton Roads.
9	MLK Freeway	I-264 to existing MLK Freeway	New 4-lane limited access facility providing better interstate access to Portsmouth Marine Terminal and the Midtown Tunnel.
10	Midtown Tunnel	MLK Freeway to Hampton Blvd	Widen to 4-lane facility with the addition of parallel tube. Reduces congestion in vicinity of PMT and Hampton Blvd.
11	Route 460	Route 58 to Isle of Wight County Line	New 6-lane divided facility between the Suffolk Bypass and Petersburg. Provides a non-tunnel, limited access entry into South Hampton Roads and improves traveler safety.
12	Hampton Roads Crossing		Various new facilities and improvements, including the East-West Connector from I-664 to the Intermodal Connector; the Craney Island Connector providing access between the Western Freeway, the East-West Connector, and a new Elizabeth River port facility; and improvements to the entire length of I-664.

SUMMARY

This document contains an extensive analysis of freight movement in and out of Hampton Roads. A summary of the key findings in this update of the Intermodal Management System is provided below:

Trends in Freight Movement through the Port of Hampton Roads

- The predominant bulk cargo at the Port of Hampton Roads is coal.
- Foreign coal trade through the Port of Hampton Roads has decreased by 48% from 1997 to 2000.
- General cargo at the Port of Hampton Roads is increasing at an annual rate of 8.9%.
- In comparison to ports on the U.S. East Coast, Hampton Roads ranked first in exports and fourth in imports in 1999.
- Hampton Roads is the second leading port on the U.S. East Coast behind the Port of New York in terms of total exports and imports in 1999.
- The top two world regions for imports and exports through the Port of Hampton Roads in 1999 were the Europe/Mediterranean/Middle East region and the Asia/India region.

Nationwide Freight Movement In and Out of Hampton Roads

- The analysis of the 1998 domestic freight movement by all transportation modes in and out of Hampton Roads found that 77.2 million tons of freight (\$71.8 billion commodity value) was transported into the region from other U.S. origins and 32.5 million tons of freight (\$66.0 billion commodity value) was outbound to U.S. destinations.
- Truck transport accounted for 50% of inbound freight and more than 74% of outbound freight for Hampton Roads.
- The primary domestic freight movement for Hampton Roads is with the South Atlantic region.

Statewide Freight Movement In and Out of Hampton Roads

- Inbound freight to Hampton Roads from Virginia PDCs accounts for 42% of the domestic freight to Hampton Roads, and freight outbound to Virginia PDCs accounts for 47% of the domestic freight from Hampton Roads.
- Of Virginia PDCs, Cumberland Plateau is responsible for the most inbound freight to Hampton Roads with 37.7%, and Northern Virginia is responsible for the most outbound freight with 46.6%.
- The primary mode of freight transportation between Hampton Roads and other Virginia PDCs is by truck.

- The primary Virginia access routes for truck traffic are Interstates 95 and 85.

Local Freight Movement In Hampton Roads

- The primary “gateway” of trucks entering and exiting Hampton Roads is I-64. Route 58 and Route 460 are also significant gateways to the region, with each carrying a daily truck percentage of greater than 20%.
- Of the freight movement within Hampton Roads, 31% moves between the Peninsula and Southside, while 69% stays on their respective sides of the Hampton Roads harbor.
- The Hampton Roads Bridge-Tunnel (I-64) is the primary crossing used to transport freight across the Hampton Roads harbor, with 58% of truck traffic crossing the harbor using that facility.

Regional Truck Data Analysis

- The average daily truck percentage on regional roadways is 5.2%. Fifteen of the 146 regional locations analyzed had a daily truck percentage greater than 10%. Most of these locations were rural and had lower than average traffic volumes.
- Fifteen locations also had greater than 2,500 trucks per day, but these locations were both in urban and rural locations.
- Eleven locations had greater than 200 trucks in the morning peak hour, and twelve locations had greater than 200 trucks in the afternoon peak hour. These locations were a mix of urban and rural locations.
- While total traffic volumes peak in the morning and late afternoon, truck volumes are consistent between 8:00 am and 5:00 pm. Truck volumes are slightly higher than average during the morning peak hour and are below average during the afternoon peak hour.

APPENDIX A

Intermodal Facilities Inventory

Hampton Roads Intermodal Management System - Inventory of Intermodal System Facilities

At-Grade Rail Crossings on the CMS Network

Jurisdiction	Street Name	Description
Ches	Campostella Ave	Just N of Liberty St
Ches	Cavalier Blvd	Chesapeake/Portsmouth CL
Ches	Centerville Turnpike	1.97 mi N of Battlefield Blvd
Ches	George Washington Hwy	Chesapeake/Portsmouth CL
Ches	Kempsville Rd	0.10 mi W of Greenbrier Pkwy
Ches	Liberty St	0.10 mi E of Poindexter St
Ches	Liberty St	Just W of Campostella Rd
Ches	Liberty St	Just N of Seaboard Ave
Ches	Military Highway	Just W of Bainbridge Blvd
Ches	Military Highway	East of Willis St
Ches	Mount Pleasant Rd	0.93 mi W of Centerville Turnpike
Ches	Old Atlantic Ave	0.29 mi S of Liberty St
Ches	Poindexter St	Just W of I-464
Ches	Providence Rd	0.19 mi E of Campostella Rd
Ches	Taylor Rd	0.08 mi S of Pughsville Rd
Ches	Volvo Pkwy	0.37 mi E of Battlefield Blvd
Ches	W Military Hwy	Just S of Airline Blvd
Ham	Aberdeen Rd	Just N of Pembroke Ave
Ham	Armistead Ave	Just S of Rip Rap Rd
Ham	LaSalle Ave	Just N of Pembroke Ave
Ham	Powhatan Pkwy	Just N of Pembroke Ave
Ham	Queen St	Just W of Pembroke Ave
IW	Route 258	Just S of Route 460
IW	Route 258	Between Route 614 and Route 619
JCC	Merrimac Trail	Between Penniman Rd and Route 677
JCC	Pocahontas Trail	At BASF Dr
JCC	Route 60	1.15 mi S of Rochambeau Drive
NN	39th St	Just E of Chestnut Ave
NN	Chestnut Ave	Just S of 39th St
NN	Harpersville Rd	0.45 mi W of Jefferson Ave
NN	Jefferson Ave	1.00 mi S of Fort Eustis Blvd
NN	Jefferson Ave	At I-664
NN	Warwick Blvd	At 40th St
NN	Warwick Blvd	At Fort Eustis Blvd
NN	Yorktown Rd	0.03 mi N of Warwick Blvd
Nor	Azalea Garden Rd	Just W of Sewells Point Rd
Nor	Bainbridge Blvd	Just N of Norfolk/Chesapeake CL
Nor	Ballentine Blvd	0.14 mi N of Princess Anne Rd
Nor	Ballentine Blvd	Just N of I-264
Nor	Berkley Ave	0.15 mi W of Indian River Rd
Nor	Berkley Ave Extended	0.24 mi W of Wilson Rd
Nor	Berkley Ave Extended	0.28 mi W of Wilson Rd
Nor	Brambleton Ave	Just N of I-264
Nor	Church St	0.18 mi S of 26th St
Nor	Cromwell Dr	0.13 mi N of Princess Anne Rd
Nor	Cromwell Dr	0.35 mi N of Princess Anne Rd
Nor	Granby St	0.10 mi N of Little Creek Rd
Nor	Hampton Blvd	Just S of International Terminal Blvd
Nor	Hampton Blvd	0.80 mi S of Taussig Blvd
Nor	Indian River Rd	0.15 mi W of Berkley Ave
Nor	Little Creek Rd	0.17 mi E of Granby St
Nor	Llewellyn Ave	Just S of 23rd St
Nor	Military Highway	0.10 mi N of Elizabeth Ave
Nor	Norview Ave	0.23 mi E of Tidewater Dr
Nor	Princess Anne Rd	0.15 mi E of Tidewater Dr
Nor	Princess Anne Rd	0.20 mi W of Ingleside Rd
Nor	Sewells Point Rd	Just S of Azalea Garden Rd
Nor	Thole St	Just W of Tidewater Dr
Port	Cedar Lane	0.11 mi N of West Norfolk Rd
Port	Churchland Blvd	0.04 mi E of Tyre Neck Rd
Port	Cleveland St	0.03 mi W of Lee Ave

At-Grade Rail Crossings (continued)

Jurisdiction	Street Name	Description
Port	Deep Creek Blvd	0.06 mi N of Frederick Blvd
Port	Effingham St	0.08 mi S of I-264
Port	Elm Ave	0.00 mi S of South St
Port	Elm Ave	0.27 mi W of Victory Blvd
Port	Elm Ave	Adjacent to Burtons Point Rd
Port	Frederick Blvd	0.15 mi S of Turnpike Rd
Port	George Washington Hwy	0.17 mi E of Frederick Blvd
Port	Greenwood Dr	0.27 mi S of Airline Blvd
Port	High St	0.29 mi E of Mt Vernon Ave
Port	High Street West	0.16 mi W of Tyre Neck Rd
Port	Portsmouth Blvd	0.10 mi E of Turnpike Rd
Port	Portsmouth Blvd	0.03 mi E of Frederick Blvd
Port	Turnpike Rd	0.65 mi E of Frederick Blvd
Port	Victory Blvd	0.02 mi S of Airline Blvd
Port	Wesley St	0.05 mi W of Lee Ave
Port	West Norfolk Rd	0.21 mi E of Tyre Neck Rd
Suf	Carolina Road	0.43 mi N of Dill Rd
Suf	Constance Rd	0.04 mi S of Pitchkettle Rd
Suf	East Washington St	Just S of Portsmouth Blvd
Suf	Holland Road	Just East of Suffolk Bypass
Suf	Main Street	0.30 mi S of Constance Rd
Suf	Nansemond Pkwy	0.40 mi W of Shoulders Hill Rd
Suf	Shoulders hill Rd	0.50 mi N of Nansemond Pkwy
Suf	South Quay Rd	Just S of Ruritan Blvd
VB	Great Neck Rd	0.17 mi S of Va Beach Blvd
VB	Independence Blvd	0.05 mi S of Columbus St
VB	Lynnhaven Pkwy	0.20 mi S of Va Beach Blvd
VB	Oceana Blvd	0.01 mi S of Oceana Blvd
VB	Rosemont Rd	0.06 mi S of Va Beach Blvd
VB	South Plaza Trail	0.14 mi S of Va Beach Blvd
VB	Witchduck Rd	0.12 mi S of Cleveland St
YC	George Washington Hwy	0.42 mi S of Fort Eustis Blvd

Commercial Service Airports

Jurisdiction	Name	Location	Address
Nor	Norfolk International Airport	End of Norview Avenue	2200 Norview Ave
NN	NN-Williamsburg International Airport	End of Bland Blvd	900 Bland Blvd

General Aviation Airports

Jurisdiction	Name	Location	Address
Ches	Hampton Roads Executive Airport	Route 58 West of I-664	5192 West Military Highway
Ches	Chesapeake Municipal Airport	West Road South of Number Ten Lane	1777 West Road
Suf	Suffolk Municipal Airport	Whaleyville Blvd	200 Airport Road
JCC	Williamsburg-Jamestown Airport	Lake Powell Rd South of Route 199	100 Marclay Road
IW	Franklin Municipal Airport	Northwest of Bus. 58/Route 258 intersection	32470 John Beverly Rose Dr

Ferry Service Terminals

Jurisdiction	Ferry Name	Description	Location
Nor	TRT Ferry	Ferry Service to Portsmouth	Waterside
Nor	Harborlink	Ferry Service to Hampton	Waterside
Port	TRT Ferry	Ferry Service to Norfolk	High Street Landing
Port	TRT Ferry	Ferry Service to Norfolk	North Landing
JCC	VDOT Ferry	Jamestown-Scotland Ferry	End of Jamestown Road
Ham	Harborlink	Ferry Service to Norfolk	Settlers Landing Road

Railroad Passenger Terminals

Jurisdiction	Description	Location
NN	Newport News Amtrak Station	Warwick Blvd between Mercury Blvd and Center Ave
Wmb	Williamsburg Amtrak Station	Boundary Street near Lafayette Street



Roadway Drawbridges

Jurisdiction	Street Name	Description	Bridge Name
Ches	Battlefield Blvd	Across Albemarle and Chesapeake Canal	Deep Creek Canal Bridge
Ches	Cedar Rd/GW Highway	Across Great Dismal Swamp Canal	
Ches	Centerville Turnpike	Across Albemarle and Chesapeake Canal	
Ches	Dominion Blvd	Across Southern Branch Elizabeth River	Steel Bridge
Ches	Elm Ave/Poindexter St	Across Southern Branch Elizabeth River	Jordan Bridge
Ches	I-64	Across Southern Branch Elizabeth River	Treakle Bridge
Ches	Military Highway	Across Southern Branch Elizabeth River	Gilmerton Bridge
JCC	Route 5	Across the Chickahominy River	James River Bridge
NN	Route 17	Across James River	
Nor	I-264	Across Eastern Branch Elizabeth River	
Suf	Kings Hwy	Across the Nansemond River	Berkley Bridge
VB/Ches	Mt Pleasant Rd/N Landing Rd	Across Albemarle and Chesapeake Canal	Coleman Bridge
YC	Route 17	Across York River	

Railroad Drawbridges

Jurisdiction	River	Location
Ches	Southern Branch Elizabeth River	0.21 mi N of Jordan Bridge
Ches	Southern Branch Elizabeth River	0.81 mi S of Jordan Bridge
Ches	Southern Branch Elizabeth River	Just S of Gilmerton Bridge
Ches	Albemarle and Chesapeake Canal	Between Great Bridge Bypass and Centerville Turnpike
Nor	Eastern Branch Elizabeth River	Between Berkley Bridge and Campostella Bridge
Nor	Eastern Branch Elizabeth River	1.22 mi E of Campostella Bridge

Intercity Bus Terminals

Jurisdiction	Bus Service	Location
Ham	Greyhound Bus Station	2 W Pembroke Ave
NN	Greyhound Bus Station	Denbigh Blvd at Warwick Blvd
Nor	Greyhound Bus Station	701 Monticello Ave
Suf	Greyhound Bus Station	812 W Constance Rd
VB	Greyhound Bus Station	1017 Laskin Rd
Wmb	Greyhound Bus Station	468 N Boundary St

Park and Ride Facilities

Jurisdiction	Description	Location
Ches	Greenbrier Mall	Mall entrance and River Birch Run
Glo	Guinea Rd	Rte 216 at Rte 17
Glo	Hayes Rescue Squad	Route 1216 (Hayes Road)
Glo	Edgehill	Route 3/14 at Route 17 Bus
Glo	Rappahannock Community College	Route 33 at Route 374
IW	Bartlett	Smith's Neck Road at Route 17
JCC	Jamestown Road	Near the Jamestown Ferry docks
JCC	Route 30	Route 30 at Route 607
NN	Yorktown Rd	Yorktown Rd at Jefferson Ave
NN	Old Courthouse Rd	Warwick Blvd at Old Courthouse Rd
Nor	Cedar Grove	Monticello Ave at Princess Anne Rd
Nor	Harbor Park	Park Avenue at Harbor Park
Port	Court St	PortCentre Pkwy at DT Tunnel
Smt	Smithfield	Route 10 at Route 258
Suf	Holland Rd	Turlington Rd at Kilby Shores Dr
Suf	Magnolia	Route 337 at Portsmouth Blvd
Suf	58 Bypass	Route 10 at Suffolk Bypass
VB	Great Neck	Laskin Rd at I-264
VB	Silverleaf Station	Independence Blvd at Holland Rd
VB	Pembroke Mall	Constitution Dr at Jeanne St
VB	Indian River	Indian River Rd at Reon Dr
YC	Rochambeau	East Rochambeau Dr at Rte 199/I-64

Port Facilities in Hampton Roads

Major Construction and Repair Facilities

Company	Juris	Location	Address
Newport News Shipbuilding and Dry Dock Co	NN	Left Bank James River, 2.8 mi - 4.0 mi above MMMBT	4101 Washington Avenue
Norfolk Shipping & Drydock Corp	Nor	Eastern Branch Elizabeth River, Right Bank, 200'-900' below Campostella Bridge	Foot of Clairborne Ave
Norfolk Shipping & Drydock Corp	Nor	Eastern Branch Elizabeth River, Right Bank, 730'-1170' above Campostella Bridge	2401 Kimball Terrance
Norfolk Shipping & Drydock Corp	Nor	Southern Branch Elizabeth River, Right Bank, 1.0 mi - 1.6 mi below lower Norfolk and Portsmouth BL bridge	750 Berkley Ave
Norfolk Naval Shipyard	Port	Southern Branch Elizabeth River, Left Bank, below Jordan Bridge	

Merchandise Terminals

Company	Juris	Location	Address
Elizabeth River Terminals	Ches	Southern Branch Elizabeth River, Right Bank, 0.1 mi - 0.3 mi below entrance to Milldam Creek	4100 Buell St
Newport News Marine Terminal	NN	Left Bank James River, 1.9 mi - 2.1 mi above MMMBT	25th St and Warwick Blvd
Lambert's Point Terminal	Nor	Elizabeth River, Right Bank, 0.2 mi - 0.6 mi North of Midtown Tunnel	Foot of Orapax Avenue
Norfolk International Terminals	Nor	Southeast side Hampton Roads, 0.0 mi - 1.5 mi north of Tanner Point	7737 Hampton Boulevard
Maersk Sealand Universal Maritime Service Corp	Port	Elizabeth River, Left Bank, 0.2 mi West of Midtown Tunnel on Pinners Point	1800 Seaboard Avenue
Portsmouth Marine Terminal	Port	Elizabeth River, Left Bank, 0.6 mi West of Midtown Tunnel on Pinners Point	2000 Seaboard Avenue

Coal Piers

Company	Juris	Location	Address
Dominion Terminal Associates	NN	Left Bank James River, 1.0 mi above MMMBT	Harbor Road
Pier IX Terminal Co	NN	Left Bank James River, 1.9 mi above MMMBT	21st St and Terminal Avenue
Norfolk Southern Railway Co	Nor	Elizabeth River, Right Bank, 0.1 mi - 0.2 mi North of Lambert's Point	2200 Redgate Avenue

Grain Elevators

Company	Juris	Location	Address
Perdue Farms Inc., South Grain Elevator	Ches	Southern Branch Elizabeth River, Right Bank, 0.4 mi above Jordan Bridge	501 Barnes Rd
Perdue Farms Inc., North Grain Elevator	Nor	Southeast side Hampton Roads, 2.0 mi north of Tanner Point	8801 Hampton Blvd

Oil Terminals

Company	Juris	Location	Address
Amerada Hess Corp	Ches	Southern Branch Elizabeth River, Right Bank, 1.0 mi - 1.2 mi above lower NS Railway	4030 Buell St
Atlantic Energy, Inc	Ches	Southern Branch Elizabeth River, Left Bank, 0.9 mi below Gilmerton Bridge, south side	2901 South Military Highway
BP Amoco Oil Chesapeake Terminal	Ches	Southern Branch Elizabeth River, Right Bank, 0.2 mi - 0.3 mi above Jordan Bridge	428 Barnes Rd
Crown Central Petroleum and Miller Oil Co	Ches	Southern Branch Elizabeth River, Right Bank, 0.6 mi below lower Norfolk and Portsmouth BL bridge	801 Butt Street
Exxon Mobil Oil Corp, Chesapeake Terminal	Ches	Southern Branch Elizabeth River, Right Bank, 0.5 mi - 0.57 mi below lower Norfolk and Portsmouth BL bridge	7600 Halifax Lane
International-Matex (IMTT), Chesapeake Terminal	Ches	Southern Branch Elizabeth River, Left Bank, 0.6 mi below Gilmerton Bridge	2801 South Military Highway
Texaco Refining and Marketing, Inc	Ches	Southern Branch Elizabeth River, Right Bank, below lower NS railway	700 Rosemont Avenue
TransMontaigne Terminating, Inc.	Ches	Southern Branch Elizabeth River, 0.4mi below Norfolk and Portsmouth BL bridge	
Koch Petroleum Group	NN	Left Bank James River, 0.4 mi above MMMBT	801 Terminal Avenue
Marine Oil Service, Inc	Nor	Southern Branch Elizabeth River, Right Bank, 0.87 mi below lower Norfolk and Portsmouth BL bridge	1421 South Main Street
Norfolk Oil Transit, Inc	Nor	Elizabeth River, Right Bank, Adjacent to Lambert's Point Docks	
BP Amoco Oil	Port	Southern Branch Elizabeth River, Left Bank, just below Paradise Creek	
US Navy Craney Island Fuel Facility	Port	Elizabeth River, Left Bank, Below Craney Island Creek	
BP Amoco Oil Co, Yorktown Refinery	YC	York River, Right Bank, 3.9 mi - 4.1 mi below Coleman Bridge	2201 Goodwin Neck Rd

Other

Company	Juris	Location	Address
Alcoa, Paradise Point Transfer Station	Ches	Southern Branch Elizabeth River, Left Bank, below lower NS Railway on south side	Foot of Alcoa Drive
Allied Terminals, Chesapeake	Ches	Southern Branch Elizabeth River, Right Bank, above lower NS railway	
Bayshore Concrete Products	Ches	Southern Branch Elizabeth River, Left Bank of Old Channel, 1300' - 1800' above lower conjunction	1010 Bells Mill Rd
Blue Circle Cement	Ches	Southern Branch Elizabeth River, Right Bank, 0.6 mi below entrance to Milldam Creek	Foot of Pratt St
Chesapeake Fertilizer	Ches	Southern Branch Elizabeth River, Right Bank, 400' below lower Norfolk and Portsmouth BL bridge	Foot of Ohio St
Citgo Petroleum Corp	Ches	Southern Branch Elizabeth River, Right Bank, 0.8 mi above lower NS Railway	100 Freeman Avenue
Davis Grain Corp	Ches	Southern Branch Elizabeth River, Right Bank, 600' above former upper Norfolk and Portsmouth BL bridge	5500 Bainbridge Blvd
Dominion Virginia Power	Ches	Southern Branch Elizabeth River, Left Bank, 0.4 mi above upper NS Railway	2701 Veeco St
Huntsman Chemical Corp	Ches	Southern Branch Elizabeth River, Right Bank, 0.2 mi above I-64	5100 Bainbridge Blvd
Jacobson Metal Co	Ches	Southern Branch Elizabeth River, Right Bank, north side of entrance to Milldam Creek	4300 Buell St
Lafarge Calcium Aluminates, Inc.	Ches	Southern Branch Elizabeth River, Right Bank, 1000' below lower Norfolk and Portsmouth BL bridge	Foot of Ohio St
Piney Point Transportation Co	Ches	Southern Branch Elizabeth River, Right Bank, above upper NS Railway Bridge	1316 Smith Douglas Rd
Royster-Clark Inc	Ches	Southern Branch Elizabeth River, Right Bank, 1500' above upper NS rail	1400 Weaver Lane
Sadler Materials Corp, Gilmerton Plant	Ches	Southern Branch Elizabeth River, Right Bank, 0.6 mi above upper NS Railway	4606 Bainbridge Blvd
Southern States Cooperative	Ches	Southern Branch Elizabeth River, Right Bank, below Gilmerton Bridge	2651 South Military Highway
Tri-Port Terminals	Ches	Southern Branch Elizabeth River, Right Bank, 950' above upper NS railway	Foot of McCloud Rd
United Winner Metals	Ches	Southern Branch Elizabeth River, Right Bank, above entrance to Milldam Creek, 600' below Gilmerton Bridge	2649 South Military Highway
Vulcan Concrete/Williams Corp of Virginia	Ches	Southern Branch Elizabeth River, Left Bank, 1000' below Dominion Blvd	120 Dominion Blvd
Vulcan Materials Money Point	Ches	Southern Branch Elizabeth River, Right Bank, 0.38 mi - 0.42 mi above lower NS railway	3900 Shannon St
E.T. Lawson & Sons	Ham	Right Bank, entrance to Hampton Creek, 350' above mouth of creek	4 Ivy Home Rd
Vulcan Concrete Sunset Creek Plant	Ham	Right Bank Sunset Creek, 800' below head of creek	11 East Sunset Road
Hampton Roads Wharf Company	NN	Left Bank James River, 0.7 mi above MMBT	Harbor Road
Papco Oil Inc.	NN	East side Newport News Creek 1500' north of entrance	407 Jefferson Avenue
Vulcan Materials Skiffes Creek Yard	NN	Left Bank Skiffes Creek, 3.7 mi above James River	313 O'Hara Lane
Allied Terminals Norfolk	Nor	Eastern Branch Elizabeth River, Left Bank, 800' above lower NS Railway	1000 Lansing Street
Chevron USA Asphalt Division	Nor	Eastern Branch Elizabeth River, Right Bank, 920' below upper NS Railway	Westminster Ave and Kimball Terrace
Lehigh Portland Cement Co	Nor	Southeast side Hampton Roads, 1.8 mi north of Tanner Point	8501 Hampton Blvd
Marpol, Inc	Nor	Eastern Branch Elizabeth River, Left Bank, 0.33 mi above Berkley Bridge	150 South Main St
Tarmac Virginia, Berkley Plant	Nor	Southern Branch Elizabeth River, Right Bank, 500' above conjunction with Eastern Branch	Foot of Mulberry St
Tarmac Virginia, Campostella Plant	Nor	Eastern Branch Elizabeth River, Right Bank, above Campostella Bridge	2125 Kimball Terrace
United States Gypsum Co	Nor	Southern Branch Elizabeth River, Right Bank, 0.76 mi below lower Norfolk and Portsmouth BL bridge	1001 Buchanan St
Vulcan Materials, Westminster Yard	Nor	Eastern Branch Elizabeth River, Right Bank, 500' below upper NS Railway	3425 Westminster Avenue
Atlantic Wood Industries	Port	Southern Branch Elizabeth River, Left Bank, above Jordan Bridge	3950 Elm Avenue
Cogentrix Virginia Leasing Corp	Port	Western Branch Elizabeth River, Left Bank, 1300' below West Norfolk Bridge	1 Wild Duck Lane
Vulcan Concrete Port Norfolk Yard	Port	Elizabeth River, Left Bank, 1.0 mi West of Midtown Tunnel	101 Chautauqua Avenue
Eastern Shore Railroad	VB	South side basin at head of Little Creek Channel	2429 Ferry Road

APPENDIX B

Breakdown of Localities Within Each Virginia PDC

Breakdown of Localities within each Virginia PDC

1: LENOWISCO	2: Cumberland Plateau	3: Mount Rogers	4: New River Valley
Lee Norton Scott Wise	Buchanan Dickenson Russell Tazewell	Bland Bristol Carroll Galax Grayson Smyth Washington Wythe	Floyd Giles Montgomery Pulaski Radford
5: Roanoke Valley - Alleghany	6: Central Shenandoah	7: Northern Shenandoah	8: Northern Virginia
Alleghany Botetourt Clifton Forge Covington Craig Roanoke Roanoke Salem	Augusta Bath Buena Vista Harrisonburg Highland Lexington Rockbridge Rockingham Staunton Waynesboro	Clarke Frederick Page Shenandoah Warren Winchester	Alexandria Arlington Fairfax Fairfax Falls Church Loudon Manassas Park Manassas Prince William
9: Rappahannock - Rapidan	10: Thomas Jefferson	11: Central Virginia	12: West Piedmont
Culpeper Fauquier Madison Orange Rappahannock	Albermarle Charlottesville Fluvanna Greene Louisa Nelson	Amherst Appomattox Bedford Bedford Campbell Lynchburg	Danville Franklin Henry Martinsville Patrick Pittsylvania
13: Southside	14: Piedmont	15: Richmond Regional	16: RADCO
Brunswick Halifax Mecklenburg South Boston	Amelia Buckingham Charlotte Cumberland Lunenburg Nottoway Prince Edward	Charles City Chesterfield* Goochland Hanover Henrico New Kent Powhatan Richmond	Caroline Fredericksburg King George Spotsylvania Stafford
17: Northern Neck	18: Middle Peninsula	19: Crater	22: Accomack - Northampton
Lancaster Northumberland Richmond Westmoreland	Essex Gloucester* King and Queen King William Mathews Middlesex	Colonial Heights Dinwiddie Emporia Greensville Hopewell Petersburg Prince George Surry* Sussex	Accomack Northampton
23: Hampton Roads			
Chesapeake Franklin Hampton Isle of Wight James City Newport News Norfolk Poquoson Portsmouth Southampton Suffolk Virginia Beach Williamsburg York			

* Locality was split between two PDCs but was assigned to the one in which it is listed.

Split localities include Gloucester(Hampton Roads, Middle Peninsula), Surry (Hampton Roads, Crater), and Chesterfield (Richmond Regional, Crater)

APPENDIX C

Truck and Traffic Volumes for Various Regional Locations

Truck and Traffic Volumes for Various Regional Locations

Regional Location Average (147 counts¹)

Daily Volume	Daily Trucks	Daily % Trucks	AM Peak Hour Volume	AM Trucks	AM % Trucks	PM Peak Hour Volume	PM Trucks	PM % Trucks
25,372	1,329	5.24%	1,724	90.8	5.27%	2,084	88.5	4.25%

VDOT Interstate Count Data

Jurisdiction	Facility	Location	Count Date	Daily Volume	Daily Trucks	Daily % Trucks	AM Peak Hour	AM Peak Hour Volume	AM Trucks	AM % Trucks	PM Peak Hour	PM Peak Hour Volume	PM Trucks	PM % Trucks
Chesapeake	I-464	Military Highway and Freeman Avenue	10/20/99	47,653	3134	6.6%	7:15	4788	245	5.1%	16:30	4027	158	3.9%
Norfolk	I-564	I-64 and International Terminal Blvd	5/13/98	73,643	3112	4.2%	6:45	7001	173	2.5%	15:15	5957	314	5.3%
Portsmouth	I-264	Victory Blvd and Portsmouth Blvd	10/20/99	53,683	3752	7.0%	6:45	4469	169	3.8%	16:00	4604	203	4.4%
Portsmouth	Route 164	ECL Suffolk and West Norfolk Rd	5/20/98	30,796	1406	4.6%	6:30	2753	69	2.5%	16:00	2626	109	4.2%
Suffolk	I-664	Bridge Road and College Drive	10/14/99	47,321	4922	10.4%	6:45	4070	317	7.8%	15:45	4643	369	7.9%
Virginia Beach	Route 13	Chesapeake Bay Bridge-Tunnel	May 2001	7,049	1391	19.7%								
York County	I-64	Route 199 and Merrimac Trail	2/25/98	56,071	5654	10.1%	7:30	4591	369	8.0%	16:45	4325	234	5.4%

VDOT Continuous Count Station Data

Jurisdiction	Facility	Location	Count Date	Daily Volume	Daily Trucks	Daily % Trucks	AM Peak Hour	AM Peak Hour Volume	AM Trucks	AM % Trucks	PM Peak Hour	PM Peak Hour Volume	PM Trucks	PM % Trucks
Chesapeake	Battlefield Blvd	I-64 and Military Hwy	5/3/00	39,045	1859	4.8%	7:00	2461	137	5.6%	16:15	3348	91	2.7%
Chesapeake	Bridge Road	Churchland Blvd and ECL Suffolk	5/3/00	19,266	419	2.2%	8:00	1055	39	3.7%	16:45	1691	20	1.2%
Chesapeake	Dominion Blvd	Cedar Rd and Bainbridge Blvd	5/3/00	26,689	1637	6.1%	7:00	2075	92	4.4%	16:45	2417	65	2.7%
Chesapeake	George Washington Hwy	North Carolina State Line and Ballahack Road	5/3/00	8,525	768	9.0%	6:00	708	39	5.5%	15:45	768	51	6.6%
Chesapeake	Military Hwy	Canal Rd and Bainbridge Rd	5/3/00	31,619	1486	4.7%	7:00	2706	131	4.8%	16:15	3035	110	3.6%
Chesapeake	Routes 13/58/460	ECL Suffolk and I-664	5/3/00	57,010	6723	11.8%	7:00	4470	375	8.4%	16:15	4674	366	7.8%
Gloucester	Route 17	Hayes Rd and Guinea Rd	11/10/99	31,951	1134	3.5%	6:30	2509	68	2.7%	16:45	3046	59	1.9%
Hampton	Armistead Ave	Tidemill Lane and HRC Parkway	5/3/00	24,181	453	1.9%	7:15	2237	44	2.0%	16:30	2195	31	1.4%
Hampton	HRC Parkway	I-64 and Magruder Blvd	5/3/00	36,168	579	1.6%	7:15	3068	53	1.7%	16:30	3401	23	0.7%
Hampton	Mercury Blvd	Chestnut Ave and Big Bethel Rd	5/3/00	50,393	1200	2.4%	7:30	2687	65	2.4%	15:30	4146	80	1.9%
Isle of Wight	Route 17	Just west of James River Bridge	5/3/00	26,635	1630	6.1%	7:00	2020	92	4.6%	16:30	2633	117	4.4%
Newport News	Fort Eustis Blvd	Jefferson Ave and NCL Newport News	5/3/00	16,330	1011	6.2%	6:45	1552	91	5.9%	15:45	1438	67	4.7%
Newport News	Jefferson Ave	Denbigh Blvd and Richneck Rd	5/3/00	36,099	1242	3.4%	7:00	2232	110	4.9%	17:00	3251	72	2.2%
Newport News	Jefferson Ave	Main St and Harpersville Rd	5/3/00	41,595	1446	3.5%	7:15	1778	99	5.6%	15:30	4183	143	3.4%
Norfolk	Hampton Blvd	49th St and Little Creek Rd	5/3/00	41,899	1520	3.6%	7:15	2907	88	3.0%	15:30	3156	149	4.7%
Norfolk	International Terminal Blvd	Hampton Blvd and I-564	5/3/00	28,423	1819	6.4%	7:30	2042	143	7.0%	16:30	2110	113	5.4%
Norfolk	Princess Anne Rd	Ballentine Blvd and Azalea Garden Rd	5/3/00	25,536	1193	4.7%	7:15	1754	117	6.7%	16:30	2065	66	3.2%
Norfolk	Tidewater Dr	Cromwell Dr and Norview Ave	5/3/00	43,147	1411	3.3%	7:30	3035	103	3.4%	16:30	3694	81	2.2%
Suffolk	North Main Street	Pruden Blvd and Old North City Limits	5/3/00	27,787	594	2.1%	8:00	1515	54	3.6%	15:45	2209	23	1.0%
Suffolk	Whaleyville Blvd	North Carolina State Line and Route 616	5/3/00	5,037	954	18.9%	6:00	275	36	13.1%	16:00	396	52	13.1%
Virginia Beach	Laskin Rd	Virginia Beach Blvd and First Colonial Rd	5/3/00	27,882	432	1.5%	8:00	1321	21	1.6%	17:15	2403	13	0.5%
Virginia Beach	Northampton Blvd	Diamond Springs Rd and Independence Blvd	5/3/00	40,801	2349	5.8%	7:15	3270	147	4.5%	16:45	3309	113	3.4%
Virginia Beach	Shore Dr	Northampton Blvd and Lesner Bridge	5/3/00	44,178	971	2.2%	7:30	3364	71	2.1%	17:00	3745	45	1.2%
York County	Denbigh Blvd	NCL Newport News and Route 17	5/3/00	15,918	425	2.7%	7:15	1053	26	2.5%	17:00	1416	19	1.3%
York County	Old Williamsburg Rd	Newport News CL and Baptist Rd	5/3/00	10,240	399	3.9%	6:30	926	36	3.9%	15:30	981	31	3.2%
York County	Penniman Rd	Route 199 and Sandra Drive	5/3/00	4,589	191	4.2%	6:15	552	5	0.9%	15:30	545	16	2.9%
York County	Route 17	Hampton Hwy and Dare Rd	5/3/00	56,204	1600	2.8%	7:00	4138	139	3.4%	16:30	4606	86	1.9%
York County	Route 199	Route 143 and I-64	5/2/00	19,528	1294	6.6%	7:30	1546	89	5.8%	16:30	2287	95	4.2%

1 – Truck data for the Chesapeake Bay Bridge-Tunnel includes only daily truck volumes and percentages. All hourly data analysis in this report does not include the Chesapeake Bay Bridge-Tunnel, but includes the other 146 locations.

HRPDC IMS Count Data

Jurisdiction	Facility	Location	Count Date	Daily Volume	Daily Trucks	Daily % Trucks	AM Peak Hour	AM Peak Hour Volume	AM Trucks	AM % Trucks	PM Peak Hour	PM Peak Hour Volume	PM Trucks	PM % Trucks
Chesapeake	Atlantic Avenue	Broad Street and Narrow Street (Portlock yard)	6/22/00	21,946	1130	5.1%	7:15	1270	82	6.5%	16:45	2195	98	4.5%
Chesapeake	Battlefield Boulevard (Route 168)	Va/NC State Line and Ballahack Road	6/7/00	17,319	2209	12.8%	6:45	1043	173	16.6%	16:00	1401	143	10.2%
Chesapeake	Dominion Boulevard (Route 17/104)	Number 10 Lane and West Road	6/15/00	6,930	906	13.1%	6:00	489	50	10.2%	16:15	566	48	8.5%
Chesapeake	George Washington Highway	Number 10 Lane and Prescott Circle	6/15/00	5,595	179	3.2%	6:30	441	8	1.8%	16:00	492	9	1.8%
Chesapeake	George Washington Highway	Wildwood Road and Wintergreen Drive	11/30/00	30,660	2199	7.2%	6:30	2056	148	7.2%	16:15	2288	164	7.2%
Chesapeake	Gilmerton Bridge (Military Highway)		6/14/00	30,550	1228	4.0%	6:15	2454	64	2.6%	16:00	2778	98	3.5%
Chesapeake	Poindexter Street	Decatur Street and Rodgers Street	7/10/00	8,860	501	5.7%	6:45	563	29	5.2%	16:15	795	57	7.2%
Gloucester	Route 17	Hillside Dr (Route 1420) and Hall Town Road (Route 677)	4/9/01	30,266	1650	5.5%	7:00	1923	94	4.9%	16:30	2518	121	4.8%
Gloucester	Route 17	N Route 17 Business and Ark Road (Route 606)	9/11/00	13,177	1048	8.0%	7:00	926	62	6.7%	16:00	1014	59	5.8%
Gloucester	Route 3/14	Route 17 Business and Beaverdam Swamp Bridge	9/12/00	13,516	475	3.5%	6:15	996	27	2.7%	16:00	1244	32	2.6%
Hampton	Big Bethel Road	Hampton Roads Center Parkway and Saunders Road	8/1/00	21,709	388	1.8%	8:00	1654	54	3.3%	16:45	2034	32	1.6%
Hampton	King Street	Little Back River Road and Langley Gate	8/1/00	8,899	150	1.7%	7:30	474	9	1.9%	16:45	908	22	2.4%
Hampton	Lasalle Avenue	Tidemill Lane and Tidemill Creek	8/17/00	19,242	846	4.4%	7:00	1693	84	5.0%	16:30	1822	85	4.7%
Hampton	Magruder Boulevard	Hampton Roads Center Parkway and Butler Farm Road	12/13/00	32,464	972	3.0%	7:15	2222	74	3.3%	16:30	2831	65	2.3%
Hampton	Settlers Landing Road	Tyler Street and Eaton Street	8/2/00	22,692	652	2.9%	7:30	1620	61	3.8%	17:00	1749	20	1.1%
Hampton	W. Pembroke Avenue	Kentucky Avenue and Powatan Pkwy	2/27/01	12,980	914	7.0%	7:15	808	83	10.3%	16:00	1004	50	5.0%
Isle of Wight	Courthouse Highway (Route 258)	Scotts Factory Road (Route 620) and Route 652	2/1/01	8,878	514	5.8%	7:30	554	23	4.2%	16:30	779	37	4.7%
Isle of Wight	Old State Highway (Route 10)	Route 10 Business and Green Run Lane	2/1/01	6,718	370	5.5%	6:15	519	24	4.6%	16:15	666	35	5.3%
Isle of Wight	Route 258	Smithfield City Limits	2/1/01	10,396	462	4.4%	7:15	643	30	4.7%	16:30	890	37	4.2%
Isle of Wight	Route 460	Winston Drive and Cut Thru Road	2/27/01	13,972	2791	20.0%	7:15	936	173	18.5%	16:30	1079	171	15.8%
James City County	Ironbound Road	Monticello Avenue and Watford Lane	8/17/00	8,753	143	1.6%	8:00	448	2	0.4%	16:30	767	12	1.6%
James City County	Jamestown Road (Route 31)	Winston Drive and Route 199	8/30/00	12,645	461	3.6%	7:30	996	44	4.4%	16:45	1075	33	3.1%
James City County	John Tyler Memorial Highway	Charles City Limits and Brick Bat Road (Route 613)	10/5/00	3,533	392	11.1%	7:30	257	36	14.0%	16:30	299	21	7.0%
James City County	John Tyler Memorial Highway	Ironbound Road and New Castle Drive (Westray Downs)	8/29/00	12,917	757	5.9%	8:00	826	75	9.1%	16:30	1020	32	3.1%
James City County	John Tyler Memorial Highway	Saint Georges Boulevard and Ironbound Road	10/5/00	14,159	566	4.0%	7:45	1003	61	6.1%	16:15	1140	27	2.4%
James City County	Longhill Road Connector	Longhill Road and Ashbury Road	8/30/00	5,476	186	3.4%	7:30	416	18	4.3%	16:15	472	8	1.7%
James City County	Old Stage Road (Route 30)	New Kent County Line and Holly Forks Rd (Route 601 N)	9/12/00	6,419	309	4.8%	7:15	555	24	4.3%	16:15	550	14	2.5%
James City County	Pochahantes Trail (Route 60)	Kingsmill Road and Busch Gardens	2/20/01	10,498	787	7.5%	7:00	730	36	4.9%	16:30	916	54	5.9%
James City County	Pochahantes Trail (Route 60)	Route 199 and Kingsmill Road	2/20/01	25,655	2199	8.6%	7:30	1864	144	7.7%	16:45	1741	127	7.3%
James City County	Richmond Road (Route 60)	New Kent County Line and Crossover Road (Route 679)	11/9/00	4,447	270	6.1%	7:00	306	15	4.9%	16:30	434	15	3.5%
James City County	Route 60	Lightfoot Road and Centerville Road	1/17/01	18,004	993	5.5%	8:00	1074	61	5.7%	16:00	1405	65	4.6%
Newport News	Bland Boulevard	McManus Boulevard and F Avenue	10/12/00	4,518	133	2.9%	6:45	223	16	7.2%	16:30	321	4	1.2%
Newport News	Huntington Avenue	25th Street to 23rd Street	2/28/01	6,609	284	4.3%	7:30	410	16	3.9%	16:00	879	18	2.0%
Newport News	Jefferson Avenue	48th Street and 49th Street	4/2/01	26,529	765	2.9%	7:00	1611	80	5.0%	16:00	2107	53	2.5%
Newport News	Jefferson Avenue	I-64 and Bland Boulevard	4/5/01	72,794	1501	2.1%	7:30	4360	124	2.8%	16:45	5806	105	1.8%
Newport News	Jefferson Avenue	Kings Way Drive and Thimble Shoals Boulevard	4/5/01	17,924	569	3.2%	6:30	1029	33	3.2%	16:00	1390	28	2.0%
Newport News	Jefferson Avenue	Richneck Road and Mcmorrow Drive	10/12/00	25,899	1334	5.2%	7:15	1620	99	6.1%	16:15	2392	132	5.5%
Newport News	Main Street	Jefferson Avenue and Tyler Avenue	8/8/00	14,822	575	3.9%	7:45	884	45	5.1%	16:45	1172	53	4.5%
Newport News	Mercury Boulevard	Jefferson Avenue and NN/Hampton city line	4/4/01	40,276	1777	4.4%	7:15	2257	93	4.1%	16:45	3257	122	3.7%
Newport News	Warwick Boulevard	64th Street and 65th Street	4/4/01	13,762	415	3.0%	6:00	838	17	2.0%	16:00	1913	58	3.0%
Newport News	Warwick Boulevard	Edgemoor Drive and Carleton Road	8/8/00	16,015	833	5.2%	7:00	1170	84	7.2%	17:00	1329	44	3.3%
Newport News	Warwick Boulevard	Fountain Drive and Matthews Road	4/4/01	33,155	1854	5.6%	6:45	2239	136	6.1%	16:15	2693	156	5.8%
Newport News	Warwick Boulevard	Johnson Lane and Manor Road	4/12/01	58,754	2007	3.4%	7:00	3006	116	3.9%	16:15	4100	161	3.9%
Norfolk	Admiral Taussig Boulevard	Bacon Avenue and Seabee Road	6/20/00	38,503	2090	5.4%	7:45	1828	100	5.5%	16:00	2602	129	5.0%
Norfolk	Campostella Road	Campostella Bridge	2/7/01	34,831	2581	7.4%	7:15	2531	244	9.6%	16:45	3192	198	6.2%
Norfolk	Colley Avenue	Redgate Avenue and Westover Avenue	7/26/00	15,433	471	3.1%	8:00	925	28	3.0%	16:45	667	13	1.9%
Norfolk	Granby Street	Broadway Street and 33rd Street	2/7/01	24,446	842	3.4%	7:30	1742	66	3.8%	16:30	1795	67	3.7%
Norfolk	Hampton Boulevard	Graydon Avenue and Westover Avenue	2/8/01	35,008	1881	5.4%	7:15	2192	129	5.9%	17:45	2195	85	3.9%
Norfolk	Little Creek Road	Bison Avenue and Meadow Creek Road	12/11/00	38,103	2338	6.1%	7:45	1937	157	8.1%	16:00	2720	153	5.6%
Norfolk	Little Creek Road	Mt Pleasant Avenue and Armfield Avenue	12/7/00	25,854	1211	4.7%	7:15	1691	78	4.6%	16:00	1976	87	4.4%
Norfolk	Midtown Tunnel (US 58)		2/20/01	31,731	1347	4.2%	6:30	2332	89	3.8%	17:45	2013	72	3.6%
Norfolk	Military Highway	Lowery Avenue and Lewis Road	3/14/01	48,860	2848	5.8%	7:00	2514	187	7.4%	16:15	3722	201	5.4%
Norfolk	Military Highway	Virginia Beach City Line and Broughton Street	3/12/01	41,357	2408	5.8%	7:15	3080	172	5.6%	16:45	4749	259	5.5%
Norfolk	Newtown Road	Ethan Allan Lane and Virginia Beach Boulevard	6/6/00	41,977	1626	3.9%	7:30	2353	107	4.5%	18:00	2728	91	3.3%
Norfolk	Norview Avenue	Azalea Garden Road and Norfolk International Airport	11/9/00	14,619	2782	19.0%	7:30	684	120	17.5%	16:45	1209	228	18.9%
Norfolk	Ocean View Avenue	Mason Creek Road and 1st View Street	1/24/01	15,043	529	3.5%	7:45	835	30	3.6%	16:30	1398	43	3.1%

Jurisdiction	Facility	Location	Count Date	Daily Volume	Daily Trucks	Daily % Trucks	AM Peak Hour	AM Peak Hour Volume	AM Trucks	AM % Trucks	PM Peak Hour	PM Peak Hour Volume	PM Trucks	PM % Trucks
Norfolk	Princess Anne Road	River Oaks Drive and Darden Street	12/5/00	26,948	2651	9.8%	8:00	1828	207	11.3%	16:00	1956	200	10.2%
Norfolk	St. Paul's Boulevard	Waterside Drive and Plume Street	10/3/01	12,194	965	7.9%	7:45	876	72	8.2%	16:15	1055	82	7.7%
Norfolk	Thole Street	Gunn Court and Galveston Boulevard	5/16/00	11,436	506	4.4%	7:45	1134	55	4.9%	16:45	899	37	4.1%
Norfolk	Tidewater Drive	Charlotte Street and Brambleton Avenue	2/6/01	24,924	728	2.9%	7:15	1836	59	3.2%	16:00	2091	57	2.7%
Norfolk	Tidewater Drive	Philpotts Road and Widgeon Road	12/5/00	36,864	3019	8.2%	7:30	2495	223	8.9%	16:00	2610	227	8.7%
Norfolk	Virginia Beach Boulevard	Glenrock Road and Poplar Hall Drive	5/25/00	36,674	2419	6.6%	7:30	2065	137	6.6%	16:45	2907	150	5.2%
Norfolk	Virginia Beach Boulevard	Hanson Street and Maltby Street	12/6/00	19,672	1044	5.3%	7:30	1311	65	5.0%	16:30	1799	68	3.8%
Norfolk	Virginia Beach Boulevard	Round Bay Road and Briar Hill Road	12/6/00	33,841	2519	7.4%	7:30	2311	213	9.2%	16:45	2722	182	6.7%
Portsmouth	Cedar Lane	Western Freeway and West Norfolk Road	11/20/00	14,757	631	4.3%	7:00	1369	43	3.1%	16:00	1260	51	4.0%
Portsmouth	Chataqua Avenue	Bayview Boulevard and Adriatic Street	11/28/00	21,447	1276	5.9%	6:00	1346	58	4.3%	16:15	1955	100	5.1%
Portsmouth	Effingham Street	King Street and High Street	11/29/00	26,251	1895	7.2%	6:30	1982	116	5.9%	16:45	1558	88	5.6%
Portsmouth	Elmhurst Lane	Cherokee Road and Brunswick Road	11/29/00	6,587	395	6.0%	7:00	535	46	8.6%	17:30	615	29	4.7%
Portsmouth	Frederick Boulevard	George Washington Highway and Portsmouth Boulevard	11/29/00	13,325	470	3.5%	6:45	842	22	2.6%	16:00	1235	34	2.8%
Portsmouth	High Street	Churchland Bridge	11/22/00	34,734	1221	3.5%	7:30	2283	47	2.1%	16:15	2692	83	3.1%
Portsmouth	London Boulevard	Peninsula Avenue and Gowdwin Street	11/27/00	30,015	1829	6.1%	8:00	2050	135	6.6%	16:30	2308	129	5.6%
Portsmouth	Mt. Vernon Avenue	Wesley Street and Adriatic Street	11/27/00	12,117	452	3.7%	6:45	1202	63	5.2%	16:00	1050	51	4.9%
Portsmouth	Portsmouth Boulevard	Mayflower Road and Hodges Ferry Bridge	11/16/00	28,086	1058	3.8%	8:00	1334	46	3.4%	16:45	2513	106	4.2%
Portsmouth	Portsmouth Boulevard	Staunton Avenue and Piedmont Avenue	11/30/00	12,068	908	7.5%	6:30	747	58	7.8%	16:00	1348	95	7.0%
Portsmouth	Victory Boulevard	Freedom Avenue and Greenwood Drive	12/7/00	24,192	1400	5.8%	7:15	1325	99	7.5%	16:15	1918	102	5.3%
Smithfield	Route 258/10	Main Street and Church Street South	2/27/01	14,690	1018	6.9%	7:00	1048	62	5.9%	16:30	1386	52	3.8%
Suffolk	Bennetts Pasture Road	Ames Cove Drive and Harbor Road	5/25/00	6,577	162	2.5%	7:00	659	27	4.1%	16:30	523	13	2.5%
Suffolk	Benns Church Blvd (Rte 10/32)	Oliver Drive (in Isle of Wight) and Kings Highway	11/13/00	9,840	764	7.8%	7:15	650	49	7.5%	16:00	899	67	7.5%
Suffolk	Bridge Road (Route 17)	Bennetts Pasture Road and Bennetts Creek Landing	6/28/00	14,533	762	5.2%	6:00	903	50	5.5%	16:00	1143	44	3.8%
Suffolk	Carolina Road (Route 13)	Whaleyville Boulevard and Turlington Road	11/13/00	5,898	875	14.8%	6:30	298	32	10.7%	16:00	583	94	16.1%
Suffolk	Carolina Road (Route 32)	Va/NC State Line	11/13/00	3,344	332	9.9%	6:00	265	20	7.5%	16:45	296	15	5.1%
Suffolk	Constance Road (Suffolk)	Kingsboro Street and Henry Street	7/6/00	20,306	1078	5.3%	7:45	1212	75	6.2%	16:15	1545	77	5.0%
Suffolk	Nanesmond Parkway	Sleepy Hole Road and Nanesmond Parkway Elem. School	7/6/00	10,821	1190	11.0%	7:15	748	90	12.0%	16:00	888	103	11.6%
Suffolk	Route 460	Suffolk/Isle of Wight County Line and Ennis Mill Road	12/14/00	18,350	2480	13.5%	7:15	1300	158	12.2%	16:15	1431	156	10.9%
Suffolk	US 58	Suffolk/Isle of Wight County line and Route 189	11/9/00	16,906	4277	25.3%	8:00	854	265	31.0%	16:00	1395	273	19.6%
Virginia Beach	Atlantic Avenue	17th Street and 18th Street	11/16/00	5,979	588	9.8%	7:45	177	12	6.8%	18:00	424	51	12.0%
Virginia Beach	Dam Neck Road	London Bridge Road and General Booth Boulevard	5/16/00	36,587	1141	3.1%	6:45	2774	89	3.2%	16:30	2819	64	2.3%
Virginia Beach	Ferrell Parkway	Indian Lakes Boulevard and Pleasant Valley Road	11/9/00	36,916	1689	4.6%	7:15	2565	144	5.6%	16:15	2791	106	3.8%
Virginia Beach	First Colonial Road	Wildwood Drive and Wolfsnare Road	5/23/00	42,951	2022	4.7%	8:00	2907	165	5.7%	16:15	3151	134	4.3%
Virginia Beach	General Booth Boulevard	Beknor Drive and Boshier Boulevard	5/16/00	31,649	1392	4.4%	7:00	2441	91	3.7%	16:30	2875	72	2.5%
Virginia Beach	Great Neck Road	Thomas Bishop and Shorehaven	6/15/00	46,829	828	1.8%	8:00	2504	58	2.3%	16:45	3416	34	1.0%
Virginia Beach	Holland Road	Rosemont Road and Lynnhaven Parkway	5/9/00	42,961	1639	3.8%	6:45	2638	148	5.6%	16:45	3149	100	3.2%
Virginia Beach	Holland Road	South Plaza Trail and Independence Boulevard	5/9/00	43,238	3205	7.4%	7:45	2601	239	9.2%	16:15	3034	200	6.6%
Virginia Beach	Independence Boulevard	Hinsdale Street and Jericho Road	11/16/00	48,173	1307	2.7%	7:30	2987	84	2.8%	17:00	3663	86	2.3%
Virginia Beach	Independence Boulevard	South Plaza Trail and Green Meadows Drive	5/9/00	29,320	1437	4.9%	7:15	1832	216	11.8%	17:00	2273	62	2.7%
Virginia Beach	Independence Boulevard	Tulip Road and Pleasure House Road	5/9/00	39,288	2446	6.2%	6:00	1286	76	5.9%	18:00	2326	150	6.4%
Virginia Beach	London Bridge Road	Wolf Street and Elon Avenue	5/23/00	17,874	1114	6.2%	7:00	1470	117	8.0%	16:00	1321	110	8.3%
Virginia Beach	Lynnhaven Parkway	Avenger Drive and International Parkway	1/18/01	47,469	1252	2.6%	7:30	3208	79	2.5%	16:15	3491	76	2.2%
Virginia Beach	Oceana Boulevard	Southern Boulevard and Bells Road	4/20/00	32,295	979	3.0%	8:00	1323	40	3.0%	16:00	2227	62	2.8%
Virginia Beach	Pacific Avenue	17th Street and 18th Street	11/21/00	16,751	1897	11.3%	7:30	1000	149	14.9%	16:15	1416	95	6.7%
Virginia Beach	Princess Anne Road	Brandywine Drive and Baxter Road	6/1/00	36,586	1251	3.4%	7:00	2673	107	4.0%	17:00	3228	64	2.0%
Virginia Beach	Shore Drive	Diamond Springs Road and Lake Shore Road	9/22/00	28,724	713	2.5%	6:45	2034	48	2.4%	16:45	2288	41	1.8%
Virginia Beach	Shore Drive	W Great Neck Road and N Great Neck Road	6/20/00	45,695	1320	2.9%	7:00	2653	85	3.2%	16:30	3634	91	2.5%
Virginia Beach	Virginia Beach Boulevard	Parks Steet and Cypress Avenue	11/9/00	9,644	289	3.0%	8:00	284	14	4.9%	17:00	678	21	3.1%
Williamsburg	Bypass Road (Route 60)	Route 132 and Parkway Drive	8/16/00	17,842	651	3.6%	8:00	1116	54	4.8%	16:00	1370	47	3.4%
Williamsburg	Ironbound Road	Longhill Road Connector and Richmond Road	8/17/00	13,723	376	2.7%	7:30	763	28	3.7%	16:30	998	30	3.0%
Williamsburg	Route 60	Ironbound Road and Bypass Road	8/15/00	31,789	1814	5.7%	8:00	1511	73	4.8%	18:00	2283	156	6.8%
York County	Colonial Parkway	Penniman Road and King Creek (E of I-64)	1/24/01	2,812	39	1.4%	7:15	312	2	0.6%	16:30	342	2	0.6%
York County	George Washington Highway	Shamrock Ave (Route 754) and Production Dr (Route 799)	9/6/00	35,179	1487	4.2%	7:30	2190	113	5.2%	17:15	2711	97	3.6%
York County	George Washington Highway	Terrebonne Rd (RTE 1233) and Denbigh Blvd (Route 173)	9/7/00	38,008	1414	3.7%	7:00	2832	129	4.6%	17:00	2894	89	3.1%
York County	Hampton Highway	Victory Boulevard and Meadowdale Road	9/7/00	28,831	1199	4.2%	7:15	1816	94	5.2%	17:00	2443	54	2.2%
York County	Route 199	I-64 and Route 60 (Richmond Road)	9/7/00	26,224	1772	6.8%	7:15	1954	131	6.7%	16:30	1900	129	6.8%

APPENDIX D

Locations with High Truck Traffic

Location	Daily Truck Percentage > 10% (> 8%)	Daily Truck Volume > 2500 (> 2000)	AM Peak Hour Truck Percentage > 10% (> 8%)	AM Peak Hour Truck Volume > 200 (> 160)	PM Peak Hour Truck Percentage > 10% (> 8%)	PM Peak Hour Truck Volume > 200 (> 160)
Admiral Taussig Blvd between Bacon Ave and Seabee Rd		✓				
Atlantic Ave between 17 th St and 18 th St	✓				✓	
Battlefield Blvd between NC Line and Ballahack Rd	✓	✓	✓	✓	✓	
Campostella Road at the Campostella Bridge		✓	✓	✓		✓
Carolina Rd (US 13) between Whaleyville Blvd and Turlington Rd	✓		✓		✓	
Carolina Rd at the NC Line	✓					
Dominion Blvd between Number 10 Lane and West Rd	✓		✓		✓	
Elmhurst Lane between Cherokee Rd and Brunswick Rd			✓			
First Colonial Rd between Wildwood Dr and Wolfsnare Rd		✓		✓		
Fort Eustis Blvd between Jefferson Ave and Reddick Rd			✓			
GW Hwy (US 17) between NC Line and Ballahack Rd	✓					
GW Hwy (US 17) between Wildwood Rd and Wintergreen Dr		✓				✓
Holland Rd between South Plaza Trail and Independence Blvd		✓	✓	✓		✓
I-264 between Victory Blvd and Portsmouth Blvd		✓		✓		✓
I-464 between Military Hwy and Freeman Ave		✓		✓		
I-564 between I-64 and International Terminal Blvd		✓		✓		✓
I-64 between Route 199 and Merrimac Trail	✓	✓	✓	✓		✓
I-664 between Bridge Rd and College Dr	✓	✓		✓		✓
Independence Blvd between South Plaza Trail and Green Meadows Dr			✓	✓		
Independence Blvd between Tulip Rd and Pleasure House Rd		✓				
John Tyler Highway between Charles City Line and Brick Bat Rd	✓		✓			
John Tyler Highway between Ironbound Rd and New Castle Dr			✓			
Little Creek Rd between Bison Ave and Meadow Creek Rd		✓	✓			
London Bridge Rd between Wolf St and Elon Ave					✓	
Military Hwy between Lowery Ave and Lewis Rd		✓		✓		✓
Military Hwy between Norfolk/VB Line and Broughton St		✓		✓		✓
Nansemond Pkwy between Sleepy Hole Rd and Mansfield Rd	✓		✓		✓	
Northampton Blvd between Diamond Springs Rd and Independence Blvd		✓				
Norview Avenue between Azalea Garden Rd and NIA	✓	✓	✓		✓	✓
Pacific Avenue between 17 th St and 18 th St	✓		✓			
Pembroke Ave between Kentucky Ave and Powhatan Pkwy			✓			
Pochahantes Trail between Rte 199 and Kingsmill Rd	✓	✓				
Princess Anne Rd between River Oaks Dr and Darden St	✓	✓	✓	✓	✓	✓
Route 13/58/460 between ECL Suffolk and I-664	✓	✓	✓	✓		✓
Route 17 between North Rte 17 Bus and Ark Rd	✓					
Route 460 between Winston Dr and Cut Thru Rd	✓	✓	✓	✓	✓	✓
Tidewater Dr between Philpotts Rd and Widgeon Rd	✓	✓	✓	✓	✓	✓
US 13 between NC Line and Drum Hill Rd	✓		✓			
US 460 between Suffolk/IW Line and Ennis Mill Rd	✓	✓	✓		✓	
US 58 between Suffolk/IW Line and Route 189	✓	✓	✓	✓	✓	✓
Virginia Beach Blvd between Glenrock Rd and Poplar Hall Dr		✓				
Virginia Beach Blvd between Round Bay Rd and Briar Hill Rd		✓	✓	✓		✓
Warwick Blvd between Johnson Lane and Manor Rd		✓				✓
Whaleyville Blvd (US 13) between NC Line and Rte 616	✓		✓		✓	